# Dental Abstracts

*a selection of world dental literature*

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AMERICAN DENTAL ASSOCIATION

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*1. To present a selection of pertinent literature representative of all points of view within the profession;*

*2. To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and*

*3. To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.*

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*The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by members of the Association. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may not be kept longer than one week. No charge is made to Association members for this service.*

## An investigation of toothbrushes and tooth pastes used in Yugoslavia

(Naša raziskovanja na področju zobnih ščetk in zobnih past)

Valter Krušič. *Zobozdrav.vest.* 10:239-277
Oct.-Dec. 1955

A special commission of the Yugoslavian Dental Association investigated the quality of toothbrushes and tooth pastes commonly used in Yugoslavia.

Toothbrushes, collected during 1954 and 1955, made either of nylon or natural (animal) bristles, were examined to establish which of these materials is better suited for dental hygiene.

The first test was made to determine to what extent nylon bristles can produce corrosive effects on the enamel surface of the teeth. Later this test was duplicated with natural (animal) bristles.

Nylon bristles, after approximately 400,000 brushings, caused severe corrosion of the enamel. No such damage was observable after the same number of brushings with natural bristles. This corrosion was caused by the hardness, the inelasticity and the sharpness of the upper edges of nylon bristles. Natural bristles bend slightly during brushing, their thickness wears off after prolonged use, and they become more elastic with use.

In the second test, both nylon and natural bristles were subjected to strong bending forces to determine the time that elapses before these materials become "overtired" and brittle. The test revealed that nylon bristles overtire soon and break frequently at their roots, especially when brushing is done with wet mediums (tooth pastes or tooth powders soaked in water). Natural bristles, however, resist the effects of wet mediums and less breakage occurs.

In the third test, the wear and tear of nylon

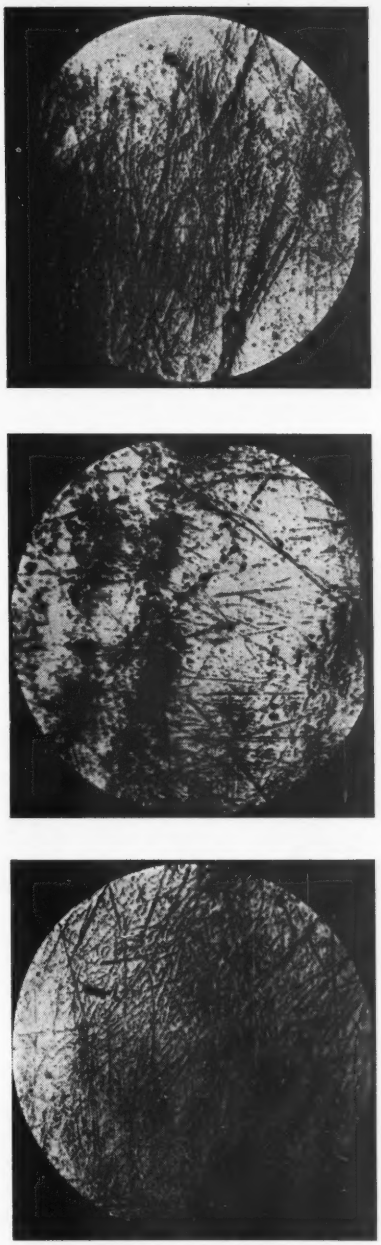

*Figure 1 Enamel surface of an incisor. Above: Before brushing. Center: After 400,000 brushings with nylon bristles. Below: After 400,000 brushings with natural bristles*

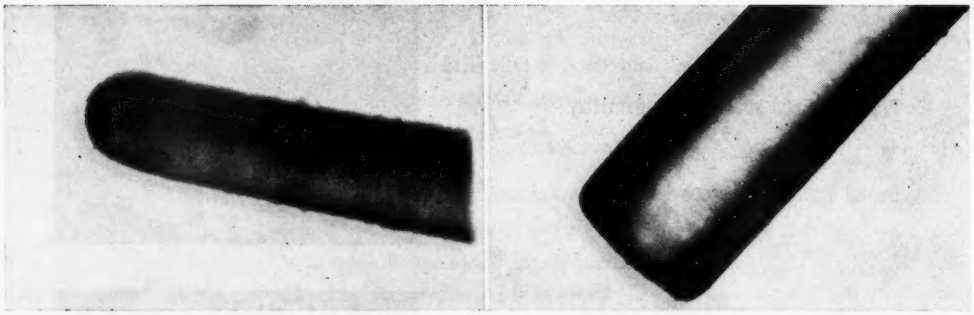

*Figure 2 Left: Tip of a nylon bristle. Right: Tip of a natural bristle*

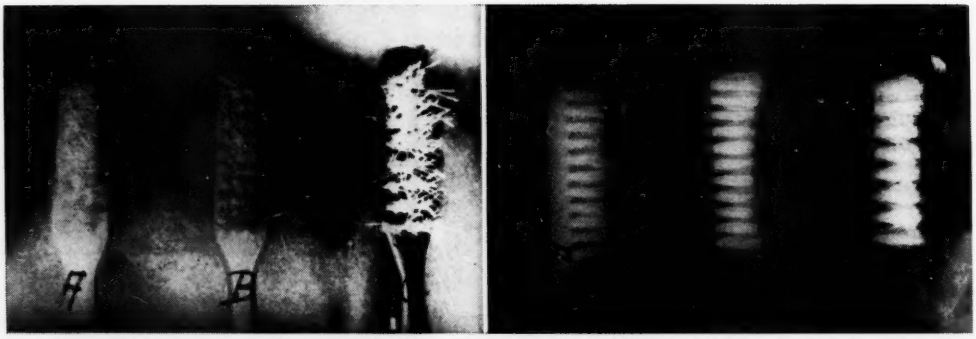


*Figure 3 Left: Bristles after having been bent 100,000 times. A, nylon bristles; B, natural bristles (used with dry mediums); C, natural bristles (used with wet mediums). Right: Wear and tear of bristles. A, nylon bristles; B, natural bristles (after one year's use); C, natural bristles (after two years' use)*

and natural bristles was compared. Although nylon bristles wear down less than natural bristles, this property has very little practical value for dental hygiene because, as established before, nylon bristles overtire soon and break easily when used for a longer period.

A series of tests was made with several brands of tooth pastes. The evidence in regard to their value as a dentifrice does not conform with the manufacturers' claims, either chemically or biologically (bacteriologically). Further investigations with more standardized products are necessary in order to establish their value.

The oral flora of a group of school children who previously had never practiced dental hygiene, was examined for nine days before and after brushing their teeth with different tooth pastes. The chemical, physical and biological variations between the samples of tooth pastes tested may be a possible explanation for the conflicting results obtained with different tests. Until the basis for such differences can be established and explained, use of the tooth paste brands tested as a medium for prevention or cure of dental caries or periodontal disease cannot be recommended. At the present time, the only claim that appears justified is that under certain conditions some of the tooth pastes tested possess a deodorizing property. A bacteriologic examination of the school children accustomed to practice oral hygiene revealed findings that were no different from those of the first group of children.

### The tooth brush

M. K. Hine. *Internat.D.J.* 6:15-25 March 1956

Although toothbrushes have been used for a long time, there is still a diversity of patterns and a multiplicity of technics for their use.

The function of the toothbrush is to remove food debris, accumulations of microorganisms, and recently deposited calculus from the teeth and to massage the gingival tissues to promote a good blood supply and adequate keratinization of the epithelium. The toothbrush should not irritate or lacerate the gingiva nor wear away the tooth substance.

When World War II interfered with the importation of wild boar bristles from North China, a nylon filament was developed and generally used. Nylon filaments have many advantages. They are more easily cleansed, they apparently will last about a third longer than natural bristles, they do not become soggy and soft, and they do not split or abrade easily. Nylon filaments can be more easily standardized so far as stiffness is concerned.

A brush made of nylon filament 0.010 inch in diameter can be considered a "soft" brush, 0.012 inch a "medium" brush, 0.014 inch a "stiff" brush and 0.016 inch an "extra stiff" brush.

The various toothbrushing technics are described. Perhaps the most effective method of toothbrushing depends on the dentist's evaluation of the patient's needs and the adaptation of one or more technics to the individual's needs.

### Effect of certain factors upon toothbrush bristle stiffness

Marjorie L. Swartz, Ralph W. Phillips and Maynard K. Hine. *J.Periodont.* 27:96-101 April 1956

The relative merit of nylon and natural bristle toothbrushes is still controversial, and the most desirable bristle stiffness has yet to be determined. An *in vitro* investigation was undertaken to evaluate the relative stiffness of nylon and natural bristle toothbrushes.

The stiffness of the natural bristle brushes tested was considerably reduced by immersion in water, even when the immersion time was only one second. The nylon bristle toothbrushes, when immersed in water, tended to retain their stiffness much better, and they also regained their original values more rapidly when allowed to dry.

A test of the brushes dipped in light machine oil showed that a reduction of bristle stiffness in water is not caused by lubrication of the brush but is more likely a softening of the brush by water sorption.

The data indicate that if the toothbrush is to regain its normal stiffness rapidly after use, it must be stored in a dry environment.

Prolonged mechanical brushing caused natural bristle brushes to splay so badly that they could not be evaluated; some softening of nylon brushes was noted but the stiffness of the nylon brushes could still be measured.

## ▼ Statistical research

### Diagnosis of functional disturbances related to defects in the dental arch

(K diagnostike funkzionalnych narushenij pri defektach subnych rjadov)

I. M. Oksman. *Stomat.,Moscow* 6:47-51 Nov.-Dec. 1955

Masticatory function depends on the type of bite present, the condition of the dental arches, the periodontium, the temporomandibular joints and also on the psychosomatic state of the whole organism.

The masticatory action of each tooth depends on its position in the dental arch, the dimension of its masticatory surface, the number of its cusps and roots and the condition of its periodontium.

Masticatory function can be evaluated through clinical examination or laboratory test.

In clinical examination, the masticatory function is determined by the number of teeth present.

In laboratory test, two methods usually are used: (1) determination of defects in the masticatory process and (2) electromyography to determine sensory and proprioceptive disturbances which modify the motor activity of the muscles of mastication. In polyclinical practice, however, both methods are too complicated to cope with the enormous number of patients to be examined.

At the Polyclinic of the Dental Institute of the University of Moscow, a modification of Agopov's method is used. Each tooth is evaluated according to its contact and masticatory surface, the number of its cusps and roots, the strength of its alveolar walls, and its position in the dental arch. The index obtained consists of masticatory units. Each lower incisor and each upper lateral incisor is counted as one unit; each upper central incisor as two; all cuspids as two; bicuspids as three; each first molar as six; each second molar as five; each upper third molar as three, and each lower third molar as four masticatory units.

In a complete dentition, the index obtained is as follows:

$$\begin{array}{l} \underline{2,\ 1,\ 2,\ 3,\ 3,\ 6,\ 5,\ 3} = 25 \times 2 = 50 \\ \underline{1,\ 1,\ 2,\ 3,\ 3,\ 6,\ 5,\ 4} = 25 \times 2 = \underline{50} \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad 100. \end{array}$$

Loose teeth have to be counted for half of their unit value only.

Two evaluations of each patient are made. The first includes an index of impaired masticatory function caused by missing and loose teeth and defects present in the dental arches. The second evaluation is a fractional number obtained after deduction of the number of teeth missing in each jaw. Its numerator consists of the masticatory units of the upper jaw; its denominator consists of the masticatory units of the lower jaw. For example: $\frac{26}{33}$.

The value of this method has been demonstrated in treatment planning to suit the needs of the individual patient. Although this method is not faultless, it is more exact than any other method used, and should be utilized in the diagnosis of functional disturbances related to defects in the dental arches, especially in the necessary evaluation of enormous numbers of patients in large dental clinics.

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## Epidemiology

**Notes on epidemiological technic in dentistry** (Notas sobre tecnica epidemiológica en odontología)

Alfredo E. Heer. *Rev.A.odont.Argentina* 43:579-584 Dec. 1955

Fractures of the upper anterior teeth illustrate the way in which epidemiologic technics can be applied to dental problems. The threefold relationship between the agent, the host and the environment must be kept in mind while studying the natural history of such accidents (or any other health problem) in a susceptible group. The natural history is the process by which the alteration in health is brought about from the earliest environmental events to the ultimate results—which may be the attainment of a balance or the appearance of incapacity or death. The better this natural history is understood, the better are the chances of controlling it successfully by the five measures proposed by Leavell: (1) promotion of health, (2) specific protection, (3) early recognition and prompt treatment, (4) limitation of the incapacity and (5) rehabilitation.

Theoretically, these fractures, which are not infrequent and which seriously affect the development of the personality, occur chiefly in children of school age. The resistance or susceptibility of the host may then legitimately be considered, because it has already been shown in epidemiology that propensity to accidents is equivalent to susceptibility.

Some of the factors that enter into susceptibility to accidents of the kind under consideration are disturbances of locomotion, vision and audition, mouth breathing and certain malocclusions. The responsible environmental factors may be physical, biologic or socioeconomic. Physical factors may be either inadequate or excessive lighting (for example, blinding sunlight), which keeps the child from seeing an obstacle, or structural defects in home or school buildings. The socioeconomic factors are important, not so much in causing the accident as in meeting its consequences. The agent will in most instances be an

obstacle that causes a fall or an abrupt movement, such as the ground, the handlebars of a bicycle, a water pipe, or even a ball or some other object used in play. Given these elements, the epidemiological problem is to investigate and determine the significance of each and the frequency with which they are found.

Much of the success of such an investigation depends on the care with which it is planned and carried out; the objectives must be rigorously defined, the data must be unbiased, and the analysis must be statistically correct. The completed study will then show the preventive measures that should be applied at each of the various levels.

Although this example is purely imaginary, it serves to show that the principles of epidemiology are no less applicable in dental disorders than they are in infectious or contagious diseases.

## ▼ School dentistry

### Care of school children in the services of preventive and assistive dentistry

(Atención a los Escolares en los Servicios de Odontologia Preventiva y Asistencial)

Carlos G. Gonzalez D. *An.españ.odontoestomat.* 14:935-941 Dec. 1955

The program now being put into effect by the Division of Dentistry of the Republic of Peru is designed especially to provide for children between the ages of three and seven years; at the same time, however, older children are given any necessary care by the Services of Preventive and Assistive Dentistry. Among the many difficulties confronting the Peruvian authorities in their efforts to promote dental health are the large number of children attending school (about 1,000,000) and the insufficient number of dental services and dentists assigned to them (32 services with 95 assigned dentists for the entire country).

A simplified five year plan providing for education, prevention and assistance has been worked out for the children of school age, that is, those over seven, with the hope that by 1960 the school population will have better dental health status and that their dental health will be under adequate technical control. Once this is accomplished, a complete and systematic plan can be drawn up to follow or supplement the one already in effect for children under seven. The educational part of the plan provides for short, simple talks on dental hygiene; posters, films and leaflets, and use of the radio and press to reach all classes and all sections of the country. Preventive measures are limited at present to the topical application of 2 per cent sodium fluoride solution to the teeth and the fluoridation of drinking water and to attempts to obtain a better balanced diet for school children. Assistance consists only of emergency interventions and treatment preceding the topical applications, that is, removal of calculus and polishing of the teeth, and care of the soft tissues.

In order to carry out this plan, the Division of Dentistry is endeavoring to secure the cooperation of the various dental services belonging to other government ministries and to reorganize those under the Ministry of Public Health and Social Assurance as a single unit furnishing integrated educational, preventive and assistive care to all the groups at present under the protection of the state.

### Health services in city school systems

W. K. Streit. *J.School Health* 26:111-117 April 1956

School health services are procedures established to appraise the health status of pupils and school personnel; to counsel pupils, parents and others; to encourage the correction of remedial defects; to assist in the identification and education of handicapped children; to help prevent and control disease, and to provide emergency service for injury or sudden sickness.

School health services supplement but are no substitute for the health care parents should provide for their children. These services are designed to encourage the utilization of the family physician and dentist and of community health agencies. There is no competition between school

health services and those provided by private dentists and physicians.

Provision of dental and medical treatment is not a school function.

Of 108 cities sent a questionnaire in 1955 on school health services, 67 replied. As regards dental services, a tabulation revealed that in 18 cities, dental inspection is given in all grades. In five cities odd numbered grades are inspected; the practice varies in the remaining cities. The Board of Education pays the entire cost of dental services in 32 cities, the Board of Health in 15 cities. Clinic service is given indigents in 35 cities. There is no clinic service in 18 cities. The per pupil cost of dental service ranged from $1.96 in Cambridge, Mass., to 2 cents in Tulsa, Okla.

## ▼ Nutrition

### Balanced diet and correct dietary habits in the prevention of caries

(Alimentación balanceada y hábitos alimentarios correctos en la profilaxis de la caries)

Hermosina B. de Gacioppo. *Rev.A.odont. Argentina* 43:594-606 Dec. 1955

The four basic principles of nutrition are that it must be sufficient, complete, harmonious or balanced and adequate for its purpose in each instance, that is, the diet needed by a growing child will differ from that needed by an adult. Adequacy is always an individual matter, in which many elements, including personal tastes as well as physical requirements, must be taken into account.

Improved nutrition is one of the factors to which the increase in average life expectancy may be attributed—the other, of course, is the reduction of infectious diseases brought about by better hygiene and the discovery of the sulfa drugs and the antibiotics. Although the relation of certain foodstuffs to dental caries has long been known, the fact that a proper diet is the principal means by which the health of the teeth is established and maintained throughout the whole of life is only now beginning to be understood.

A highly destructive dental condition caused by a diet deficient in protective foods is melanodontia (hypoplasia?), which begins insidiously at the age of 1 or 1½ years. It appears in the form of white spots that gradually darken and spread until they involve, first, the middle third of the labial aspect of the four upper incisors and then the grinding surfaces of the four first molars and, finally, the upper bicuspids; the lower incisors and the second molars are rarely affected. Eventually, the teeth crumble and the gingiva becomes abscessed; extraction then is the only remedy. Caries usually accompanies melanodontia, but it can be prevented if the diet is corrected in the early stages; in this instance, the teeth, though small and malformed, may remain useful until the time comes for them to shed naturally.

Statistics gathered over a period of ten years show that the incidence of caries in children at the Casa Cuna where diet is supervised is less than 50 per cent, whereas in the general school population in the province of Córdoba it is 95 per cent. Responsibility for the inculcation of correct eating habits rests on the mothers, and efforts should be made to instruct them in the principles of proper nutrition. In more than one instance, when these principles were explained to a mother and her child and their cooperation secured, a radical change in diet, for example, from sweets and pastry to milk, meat and green vegetables, combined with appropriate dental care has not only saved affected teeth but has improved the general condition and disposition of the child.

### Principles of rational dental treatment

B. Cooke. *D.Mag.& Oral Topics* 73:9-17 March 1956

Attempts to restrain microbe destruction of the dental tissues by the use of enzyme inhibitors, antiseptics or drugs are unsound biologically. No mouth is sterile after birth, and the nature of its ever-changing microorganic content is governed by the metabolic make-up of the individual, by the anatomic arrangement of his teeth, by his

dietetic and other habits, and by all that completes his environment.

The microbic occupation of the oral cavity is a natural phenomenon. The logical approach is to harness the activities of the oral microbes to the well-being of the individual, and not to indulge in empirical "remedies" that are antagonistic to such well-being. The microbes of the mouth must be assisted in their function of removing debris from the oral tissues without their invading the dental structures to facilitate this activity.

Dental morbidity is the disharmony of the masticatory apparatus, largely brought about by the local influence of a civilized diet while in the mouth, by the failure of such a diet to stimulate beneficial chewing, and by its inadequate contribution to body metabolism.

The vigorous chewing of a primitive diet exercises the teeth and jaws, increases the flow of protective oral secretions, aerates the bolus and leaves a debris in the mouth which is fibrous and is of a chemical make-up sufficient to the needs of the scavenging microbes without their having to invade the dental tissues to satisfy such needs. The metabolic consequences of such a diet are to raise the individual's resistance to microbic invasion of his tissues to its optimum.

In a modern diet, on the other hand, the food is comparatively structureless, requires the minimum of mastication, and is refined, devitalized, chemically separated, demineralized and of such a physical nature that it sediments on and between the teeth, settling as a fine slime on the soft tissues; it encourages anaerobic rather than aerobic decomposition, thus favoring a constant, corrupting, putrescent action on the dental structures.

Dentistry should aim to convince the public of the importance of a whole natural diet in preference to that consumed today.

Oral hygiene, to be effective, must be based on biologic principles. Real oral hygiene consists of assisting the natural microbic population of the mouth in its function of removing debris, and not in using antiseptics or other factors calculated to confuse this activity. The inclusion of charcoal or some other factor to provide "crumb" structure for the essential base exchange mechanisms would appear to be of advantage and to help aerobic activities. The remainder of the medium would probably consist of amino acids, urea, inorganic salts, with, possibly, traces of fat, vitamins and other factors.

A "fibrous chew" should be devised akin to the structure of stringy celery, which could be employed in conjunction with such a medium. Its use for a minute or so after a meal would stimulate mastication, increase the flow of oral fluids, massage the gums, facilitate aeration, and help the aerobic process.

## Carbohydrates and dental caries: special diets for control of caries

(Hidratos de carbono y caries dental: especiales como medio de control)

O. Olano. *An.españ.odontoestomat.* 14:703-716 Sept. 1955

Extensive epidemiological research studies have shown that there is a correlation between the consumption of carbohydrates, the increase in the number of *Lactobacillus acidophilus* in the saliva, and the development of dental caries. Dental caries is frequent in countries in which the people, mainly the children, overindulge in the consumption of sugar, whereas it is less frequent in countries in which the consumption of sugar is moderate.

*L. acidophilus* are present in the saliva of almost all persons with dental caries. Sufficient fluoridation of potable water lowers the number of this bacterium in the saliva and diminishes the incidence of dental caries. The action of carbohydrates in favoring the development of *L. acidophilus* in the saliva, the effect of the consumption of sufficiently fluoridated water on the bacteria and caries as well as the constant presence of the bacteria in the saliva of persons with dental caries indicate the role of these bacteria in the etiology of dental caries. It has been observed that the administration of diets from which sugar had been completely removed or of diets containing a smaller amount of carbohydrates greatly diminished the number of *L. acidophilus* in the saliva. The number of bacteria in the saliva continued to be small after carbohydrates were restored to the diet, and the incidence of dental caries decreased.

Diets from which carbohydrates have been

temporarily removed or diets containing a diminished amount of carbohydrates are not harmful to the individual who manages in some other way to eat a well balanced diet for the time the sugar is withheld. Diets that do not include carbohydrates, or in which they are present in small amounts only, give satisfactory results in the prevention of caries in those countries in which drinking water is not being fluoridated.

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## Caries etiology and control

### Some present-day views on dental caries

A. M. Horsnell. *M.Press* 235:313-315 April 18, 1956

Many theories have been advanced over the centuries as to the cause of dental decay, and most have aimed at finding one single agent. Today it is appreciated that to look for one single cause is fallacious; many factors leading to destruction of the tooth must be considered.

In 1890, W. D. Miller propounded the carbohydrate stagnation theory in which the acidogenic bacteria of the mouth were presumed to act on the remnants of carbohydrate food sticking around the teeth to form acid which dissolved away the enamel. This theory is no longer accepted in its entirety. What is accepted is that in those patients with a high caries incidence there is also found a large number of acidogenic bacteria, including *Lactobacillus acidophilus.*

Other workers maintain that decalcification of the enamel is not the first stage of the disease process, but that this is initiated by hydrolysis of the organic matrix which in turn leads to an attack on the calcium of the enamel.

Orland, of Chicago, using a strain of rats susceptible to caries, has bred and kept these rats in a germfree atmosphere and has failed to produce any caries.

Tooth formation itself, particularly the process of calcification, is regarded by many as an important factor. Mellanby attaches great importance to the part played in calcification by vitamin D.

Toverud and others assert that a preponderance of carbohydrates in the diet can lead to a lowered resistance of the teeth to caries.

The role of good oral hygiene in inhibiting caries has been stressed by Fosdick. Kesel and others, studying the saliva of caries-free persons, found that the filtrate of the stagnant (resting) saliva had an inhibiting effect, and that this was proportional to the ammonia nitrogen.

The low incidence of caries in uncivilized communities has led to the inference that the ingestion of manufactured or processed foodstuffs by those in civilized communities must be a potent factor in the production of caries.

American scientists have shown that by adjusting the fluorine content of water to 1 ppm, a substantial reduction in the caries incidence has followed. The application of a solution of sodium fluoride to the erupted tooth crown also produces a reduction in caries in these teeth. The enamel of a tooth is not just an inert substance. Bergren in Stockholm has shown that there is a circulation (probably lymph) between the dentin and enamel in teeth in which the pulp is vital.

The fetal environment has been considered a factor by some investigators. The part that the biochemic processes may play in tooth structure may prove of fundamental importance.

The cause or causes of what was once thought to be a simple local disease can only be discovered by the combined investigations of dentists, embryologists, comparative anatomists, biochemists, physiologists and physicians (including surgeons).

### Some considerations of fluoride in relation to dental caries

Finn Brudevold. *J.New Jersey D.Soc.* 27:15-17 Jan. 1956

When the pronounced caries reducing effect of fluoride is considered, it is surprising that only small amounts of this element have been found in the enamel. Enamel from permanent teeth of persons living in Rochester, N.Y., has fluoride concentrations of approximately 100 ppm and enamel from deciduous teeth only about 60 ppm. Even in high fluoride areas where teeth become

mottled, concentrations of only 300 to 600 ppm of fluoride have been found in the enamel.

Until recently it has been difficult to understand how such small concentrations of fluoride could so noticeably change the caries susceptibility of the enamel. Recent studies have shown that, although the amount of fluoride in the enamel is small, the distribution is uneven, with large amounts in the outer surface enamel and small concentrations in the bulk of the enamel. In all types of teeth there are much greater amounts of fluoride in the superficial layers (each totaling only a few tenths of a millimeter in thickness) than are found in the subsurface of the enamel.

In unerupted teeth there is almost three times as much fluoride in the surface layers of the fully formed teeth as is found in the enamel of teeth which have only the crown formed. This suggests that only a small amount of fluoride is laid down in the inner portion of the bulk of the enamel during its formation, but that in the fully formed unerupted teeth the surface layers continued to accumulate fluoride. Presumably this is the result of their being exposed to the highly vascular soft tissue from which fluoride continued to pass to the enamel after the enamel itself was morphologically complete, but the remainder of the tooth was developing to the point of eruption.

Although the fluoride content of the blood is exceedingly low (0.01 to 0.04 ppm), considerably higher concentrations appear in the teeth. The magnitude of this build-up depends on the amount of fluoride present in the tissue fluids and the period of time during which the enamel surface is exposed to these fluids. By projecting curves based on findings reported elsewhere, it is possible to estimate that in the extreme external layer of the enamel (a few molecules thick and therefore beyond the possibility of chemical analysis) the fluoride concentration would reach 0.7 to 0.8 per cent (7,000 to 8,000 ppm).

The type of fluoride distribution suggested serves to explain how small amounts of this enamel increase the resistance to dental caries. The high concentration of fluoride throughout the outer enamel crystals enables them to serve as a protective coating. The immediately underlying enamel is more vulnerable, and the bulk of the enamel is even more easily destroyed.

That fluoride acts primarily as a surface protective agent fits in well with clinical observations.

The view that the resistance of teeth to caries is related more to the composition of the most superficial part of the enamel than to the composition of the enamel as a whole, deserves continued attention.

## Electron microscopic studies on the prophylactic effect of the topical application of sodium fluoride on dental caries

Seiichi Matsumiya, Shosaburo Takuma, Hidetsugu Tsuchikura and Kenichi Okada, Tokyo.
*Indonesian D.J.* No. 7:19-30 1956

The prophylactic effect on dental caries of a 1 per cent to 2 per cent solution of sodium fluoride applied topically to teeth *in vitro* was studied by means of electron microscopy and electron diffraction. The teeth were immersed for periods of from two seconds to 30 days. The following results were observed:

1. The teeth to which sodium fluoride had been applied showed a considerable ability to resist caries *in vitro*.

2. The rate of caries development when several teeth are immersed in the same culture depends on the exposed area of tooth surface and the length of the experiment; the greater the exposed area, the lower the rate of caries development and the smaller the area, the greater the rate of development.

3. When the exposed area of the tooth is 7 by 5 mm., a sufficient experimental time for favorable preparation for electron microscopy is 48 hours.

4. When an enamel slab is treated with 2 per cent sodium fluoride for more than three days, various deposits of calcium fluoride form on the surface, the amount of the deposit increasing with the length of immersion.

5. Of seven teeth treated for periods ranging from 5 to 30 days and then washed for two hours in water, one showed no deposit at all, and two showed a few traces of deposits. The rest showed some degrees of deposit.

**Operative dentistry**

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Inlays and fillings

## Prevention of secondary expansion of amalgam fillings containing zinc

(Die Verhütung der sekundären Expansion von zinkhaltigen Amalgamfüllungen)

J. G. de Boer, Groningen, The Netherlands.
*Zahnärztl.Welt & Reform* 11/57:39-40
April 25, 1956

Secondary expansion of amalgam fillings can be prevented by (1) the use of zinc-free alloys, and by (2) elimination of moisture contamination.

Most alloys for tooth fillings on the market today contain zinc; therefore, the prevention of moisture contamination is imperative even if zinc-free alloys are utilized.

The three main sources of moisture contamination have to be avoided: (1) handling the filling material with the fingers or, even worse, squeezing it in the palm of the hand; (2) using mouth mirrors while inserting the amalgam in the tooth, and (3) allowing contamination of amalgam by saliva, serous exudate or blood.

The use of a specially designed amalgam mixer, made of rubber, is shown in the accompanying illustrations. The amalgam should be mixed with mortar and pestle, or in a mechanical mixer. The mixing procedure then is completed in the amalgam mixer by a few additional strokes after squeezing out the excess mercury. The amalgam has to be taken out of the mortar or mixer with the aid of dry cotton rolls or with one finger covered with a fingerstall.

Condensation of surface moisture can be prevented by the application of the rubber dam or by preheating each amalgam quantity to mouth temperature before inserting it into the tooth cavity. Clinical experience, however, indicates that contamination by moisture will be negligible if the rubber amalgam mixer is used.

The elimination of contamination by serous exudate or blood presents a problem in Class V cavities only. To avoid disturbances, the following procedures are recommended: (1) the gingival margin is touched with phenol before cavity preparation; (2) a few drops of epinephrine are injected into the gingiva before the filling is inserted; (3) a rubber dam clamp is placed on the tooth, thereby compressing the gingival margin; (4) a rubber dam is applied in instances of stubborn oozing or bleeding (a piece, one inch square, pulled over the clamp usually will be sufficient), and (5) a temporary gutta-percha filling is inserted which pushes away the gingival margin and a more favorable condition is present at the next appointment.

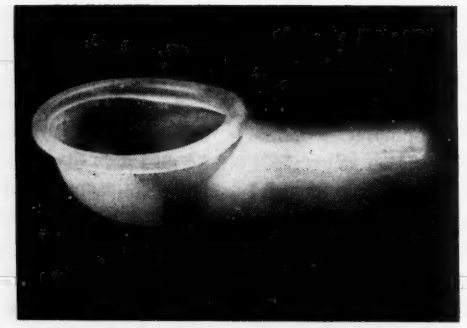

***Figure 1 The rubber amalgam mixer designed by the author***

*Figure 2 During mixing procedures, the mixer is kept closed to prevent escape of mercury*

*Figure 3 The quality of the mixture is evaluated*

*Figure 4 The excess mercury is squeezed out*

*Figure 5 The amalgam mixture is taken out with an amalgam carrier*

*Figure 6 The mixed filling material, when it becomes brittle, is kneaded with one hand*

### The "fusion lamina," a new technic in direct inlay casting

(La "lamina di fusione" nell'intarsio diretto)

Americo Colombo. *Riv.mens.svizz.odont.* 66:128-136 Feb. 1956

The direct inlay casting method, if correctly performed, produces more satisfactory results than obtainable by indirect methods. Unfortunately, in complicated cavities, the removal of the wax pattern frequently presents difficulties which may lead to failures.

Reducing and eliminating these difficulties will enhance the usability of the direct inlay casting technic in all instances and will increase the value of the dentist's work.

A new technic, called "fusion lamina" method, has been introduced to replace the customary pivot technic. Such a fusion lamina can be constructed of any metal; it should be 10 mm. high and 0.21 mm. thick, but its width can vary from 1 to 10 mm. Fusion laminas, as compared to pivots, have the following advantages: (1) the possibility of distortion of the wax pattern at the region of its attachment is greatly minimized; (2) the elastic traction is transmitted on the widest possible surface; (3) the wax pattern receives a firm support which reduces the possibility of distortion by twisting, and (4) the casting can be performed with the customary instruments.

When the fusion lamina technic is utilized, fractures of the wax pattern are avoided. The metal lamina permits a far greater extension than do customary pivots. The reduced thickness of lamina (compared with that of a pivot at an equal temperature) decreases transversal disturbances which usually occur during the insertion of the wax.

Since it is necessary to soften the inlay wax to a consistency which will permit its adaption to the angles and walls of the preparation, the fusion lamina technic also minimizes the danger of volatilization of wax ingredients and avoids alterations in its physical property.

In complicated cavities, two or three of these fusion laminas can be used simultaneously. In such instances, the main lamina is inserted, the others attached close to it and then fused together with wax. The minute spaces between the laminas must be closed after the elimination of the wax.

During the laboratory work, the lamina (or laminas) should be strengthened by a fine wax covering to facilitate easy removal from the cylinder.

When the wax pattern has been made and removed from the tooth, it can be invested immediately. When such patterns are not invested immediately, distortions may appear which are caused by a reaction of wax to temperature changes or by the release of stress within the wax patterns. Both difficulties, however, are greatly reduced when fusion laminas are used because the laminas strengthen the consistency of wax, and, therefore, fusion lamina patterns can be preserved longer in a usable condition than is possible with customary patterns.

Crystallographic examinations reveal that the crystallization of inlays to which fusion laminas are attached is identical to that of inlays with pin or pivot attachments.

Especially in complicated types of retainers or in instances in which access to the teeth is difficult, much time and effort can be saved by utilizing the fusion lamina technic in direct inlay casting.

### The use of rotary instruments at ultra high speeds

E. A. McEwen. *J.Georgia D.A.* 29:10-14 April 1956

Sonic speeds in restorative procedures provide an efficient, trauma-free, vibration-free method of removing enamel. The development of a handpiece to permit treatment above the vibration perception of patients has resulted in a new idea of cavity preparation. Because of the high peripheral speed the operator uses smaller instruments and very light pressure. For the first time in dentistry the instruments are performing the work for which they were designed. The instrument is used rather as a paint brush with a feather touch and is applied as an artist's fine camel's-hair brush rather than with the heavy action of a calcimine brush.

Carbides cut enamel most efficiently above 100,000 rpm and seem to plane rather than mill. Diamonds of proper grit and design also cut efficiently. A coarser grit is required with a wider distribution of the particles than is efficient at speeds of 20,000 rpm.

Water or water spray lubrication must be used with all carbide, carborundum and diamond instruments.

Instruments used at the new high speeds include the following: carbide burs, no. 2, 6, 700, 701, 702, 557 and 558; diamond instruments—small, thin wheel stones for the initial opening, small cylinder instruments of various shapes for extending and finishing, and hollow cone instruments of various shapes for extending and finishing; extracoronal instruments—wheel stones, saws, disks and small cylinder instruments, and carborundum instruments—wheel stones, tapered cylinders and cone-shaped instruments.

The operator employing high speeds will enjoy an exciting experience in better dentistry, and the patients will appreciate this modern treatment.

### Varied applications of direct pin inlays

Roland T. Lamb. *J.Canad.D.A.* 22:282-287 May 1956

Retention for gold inlays, crowns and fixed bridges must be adequate or the restorations cannot be successful. A number of variations in cavity preparation employing retentive pin inlays have been devised, as has a method of manipulating inlay waxes so that direct wax patterns may be made in these preparations.

When the amount of gingival erosion is extensive, the mesial and distal walls of the eroded region extend beyond the line angles of the tooth. The occlusal and gingival walls afford insufficient retention form for a gold inlay or a plastic restoration.

A practical technic to restore tooth structure lost through erosion of the gingival portion and part of or all of the middle third is described. Two parallel pin holes are made with a no. 700 cross-cut taper-fissure bur, using either a straight or contra-angle handpiece. The pin holes are made at the greatest axial depth of the eroded region at points 1 mm. from both the mesial and distal root surfaces. The pin holes are 1 to 1.5 mm. deep. The two pin holes are made parallel by securing a steady finger rest position which allows freedom of movement of the handpiece; the bur is worked alternately in each of the holes. Generally the two pin holes are roughly parallel with the root surfaces and parallel with the occlusal plane. Caries (if any) and acute enamel margins are removed.

Cavity preparation and forming of the wax pattern are facilitated if a rubber dam and retracting gingival clamp are used.

A medium hard inlay wax is used. The preparation is lubricated and the excess wax is blown out with air to leave only a thin film. Softened wax is carried to the preparation on a spatula or wax carrier loop. The wax is forced into the pin holes by using a pointed instrument whose end is shaped to a size slightly smaller than a no. 700 bur. If this wax plugger is heated at a point about half an inch from the tip it ensures that the wax will be driven to the base of the pin holes. The heated end of the plugger is pushed through the wax pattern of the pin holes. The wax will melt and run ahead of the tip to fill the two pin holes completely with wax. The pattern is contoured with a 14 gauge wax sprue while still in the tooth, removed and placed on a damp swab. The pattern is invested as soon as possible to minimize distortion.

Before the patient is dismissed, a pledget the size of a no. 2 round bur is rolled from a few wisps of cotton and forced into each pin hole and the external orifices are filled with a surgical cement.

The casting is made in 22 karat gold.

Technics also have been developed to stabilize teeth with and without inlays; to replace a posterior tooth utilizing restorations already present in the abutment teeth; to replace posterior teeth in instances of extreme abutment alignment, and to repair badly broken down vital teeth with a stapled core. The technic of direct wax adaption to parallel pin holes broadens the scope of feasible restorative dentistry.

**Periodontics and endodontics**

▼

Periodontics

## Utilization and evaluation of roentgenograms in periodontal disease

(Die röntgenologische Diagnose der marginalen Zahnbetterkrankungen und ihre klinische Auswertung)

Eugen Fröhlich. *Deut.Zahnärzte Kal.* 15:110-122, 1956

Two basic forms of marginal degeneration in osseous tissues of the oral cavity can be observed: (1) vertical degeneration, usually caused by inflammation of gingival tissues, and (2) lateral degeneration, frequently occurring after systemic disturbances.

In vertical bone degeneration, the alveolar crest recedes apically. By changing its normal position, the alveolar crest loses its normal height until it is below the level of the cementoenamel border. The highest point of the interdental septum and the outer edges of the alveolus then are equal in height.

In lateral bone degeneration, sphenoidal defects appear on the marginal periodontium. The base of the pockets then lies below the level of the alveolar crest. In the interdental septum, lateral degeneration is observable. In roentgenograms, however, these defects, usually appearing on one side of a tooth only, often are covered by the shadows of the teeth.

Microscopically, a chronic inflammatory reaction of soft tissues surrounding the teeth is followed by necrosis of the epithelium in the depths of the pockets. Local irritants such as calculus, inadequate fillings, loss of contact between teeth, or traumatic occlusion, are exciting causes of both types of bone degeneration.

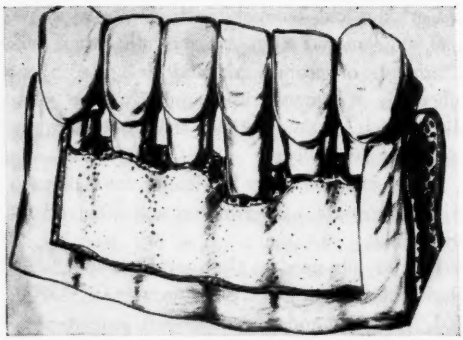

*Figure 1 Vertical degeneration of the alveoli of lower incisors*

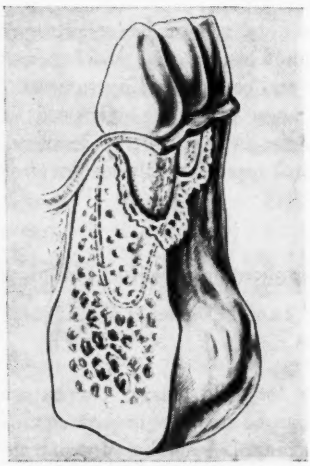

*Figure 2 Gradual degeneration*

*Figure 3 Gradual degeneration of the alveoli of lower bicuspids*

The true lateral degeneration in which deeper layers of the periodontium are not penetrated, is termed the "periosteal" type of periodontosis (O. Weski).

The great variation of periodontal symptoms appearing in roentgenograms often leads to differences in diagnosis, treatment planning and, therefore, to a diversity of opinions.

It must be emphasized that an accurate interpretation of roentgenograms is only possible when the highest standards of roentgenographic technics have been used. With a precise technic, however, it will be possible to recognize roentgenographically changes in the alveolar and periodontal regions indicating metabolic disturbances which had not been disclosed by physical examination, or had not, as yet, produced clinical manifestations.

A definite number of roentgenograms should constitute the basic, or initial, roentgenographic examination. From 16 to 18 standard-size films are ideal because it is then possible to place the films in identical positions in each mouth, so that roentgenographic anatomy always will be recorded in the same relative position. This method for all basic roentgenographic examinations will do more than any other single factor to expedite

*Figure 5 Deep vertical pocket on a lower third molar. Testing with a silver needle*

*Figure 4 Periodontal pocket on the distal side of an upper cuspid*

*Figure 6 Combined vertical and lateral degeneration of the alveoli of the second bicuspid and second molar*

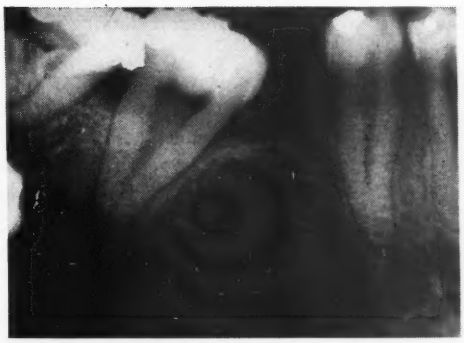

*Figure 7 Functional sclerosis of the alveolar bone*

roentgenographic interpretation of periodontal diseases.

Frequently, it will be difficult to diagnose the periodontosis syndrome correctly, as one symptom overshadows the other, and many etiologic factors are present at the same time. Misinterpretations of roentgenograms, however, are mainly caused by (1) lack of experience in interpreting roentgenographic shadows, and (2) lack of knowledge of general and dental pathology.

A much greater degree of success in treatment of periodontal disease would be assured if it were realized that diagnosis in the incipient stages is a difficult procedure. Hyperemia of the labial and buccal gingiva is evidenced in roentgenograms as a dark coloration but it must be stressed that the pathologic condition of the gingiva is subject to considerable variation, and in some instances the gingiva will present no distinct redness except as a result of an occasional acute inflammation.

Good roentgenograms, properly evaluated, are the best aid in diagnosing all periodontal diseases.

## Gingivectomy

Colm A. O'Sullivan. *Irish J.M.Sc.*
No. 363:119-129 March 1956

Gingivectomy, a method of pocket eradication which entails the removal of the diseased gingiva that forms the pocket wall, consists of scaling and planing the root surface, and removing the gingiva. Indications include periodontal pockets, bifurcation and trifurcation involvements, periodontal abscess, gingival enlargement, pericoronal flaps and the need for recontouring of the gingiva.

The selection of patients is of major importance in periodontal treatment. The patient should be anxious to have treatment and should be willing to carry out the prescribed home care; failure to persevere with home care renders futile any periodontal surgery.

Factors in the choice of treatment include the depth of the pockets and the type of tissue present. Scaling and instruction in oral hygiene should be carried out one or two weeks before the surgery.

Bleeding during the operation is reduced by infiltration anesthesia and papillary injections which produce a localized vasoconstriction. A pocket-marking forceps is used to indicate on the gingiva the depth of the individual pocket. Resection of the gingiva can be achieved through surgery (with the knife), electrosurgery, cautery or chemosurgery. The incision can be a continuous one, or a series of separate incisions for each tooth can be used. It is desirable to have a scalloped incision that follows the root surface immediately apical to the base of the pockets and forms an angle of 45 degrees to the root of the tooth. The incision should penetrate interdentally to meet the incision from the opposite aspect midway interdentally. The resected gingiva is removed with a tweezers and sickle scaler.

After the gingiva has been removed the dentist should pause and survey the field of operation to look for residual pockets, calculus remnants, adherent tags of gingiva, granulation tissue, caries or irregularities of the root surface, and bleeding points. Any calculus remaining is removed. The root surface is planed to smooth it and to remove any necrotic cementum, washed with a warm antiseptic solution, and observed to ensure that all bleeding has stopped and that the wound is covered with a well-formed clot.

The first stage of the after-care is the packing, which acts as a splint, controls postoperative bleeding, minimizes the possibility of infection, eliminates trauma from food, prevents the formation of a dead space, and makes the patient comfortable. The pack is removed after seven days, the region observed and the patient carefully instructed in home care. A very soft brush is advised for the first week, to be succeeded by the permanent use of a medium brush. The patient is advised to use wood points ten times in each space twice a day, or preferably, more often indefinitely. One week after the removal of the pack the condition of the treated region is again observed. The patient should also be seen four weeks after gingivectomy. At this stage the mouth should be well healed. Three months after surgery the patient should be recalled, and henceforth inspection and scaling should take place at six month intervals.

Common causes of failure of the operation are classified.

### Periodontosis and its treatment
(Die Paradentose und ihre Behandlung)

Robert Neumann. *Zahnärztl.Rundschau* 64:581-586 Nov. 20, 1955

One of the most dangerous enemies of dental health is calculus which exists in the oral cavity of many patients. Calculus is a major causative factor in marginal inflammations or infections of the alveolar process. A superficial elimination of these concretions certainly is inadequate. Whenever the slightest alteration, especially a bluish discoloration of the mucous membrane and the papillae, occurs, the calculus formation must be examined.

In instances of periodontal disease, especially in periodontosis, the concretion often reaches to the root apexes.

It is not possible to treat periodontosis successfully without thorough elimination of all calculus formations.

Mechanical, surgical and therapeutic procedures will lead to failures unless even the smallest, hardly visible, new formations of calculus are removed systematically.

## ▼ Endodontics

### A review of a technic for pulpotomy and report on 175 cases

C. Cooke and T. C. Rowbotham. *Brit.D.J.* 100:174-177 April 3, 1956

A pulpotomy technic has been employed since 1944 to treat Class III fractures of the crown in which the pulp is exposed. Of 175 teeth so treated, success has been attained with 142 teeth.

The operation is done under local anesthesia when possible. The tooth is isolated with a rubber dam, and the whole region is swabbed with 70 per cent alcohol and dried with warm air. A sterile no. 3 crosscut fissure bur is used to remove the roof of the pulp chamber to reveal the extent of the coronal pulp. With the engine revolving at a low speed, the bur is guided down one of the proximal walls of the pulp chamber to a point just below the neck of the tooth and then moved slowly across the pulp chamber as far as the other proximal wall. Most of the debris adheres to the bur; any remaining on the walls of the cavity is removed with a sterile excavator. A small pledget of sterile cotton wool, moistened with eugenol, is placed lightly on the cut surface of the pulp and sealed in with cement. Pressure on the pulp must be avoided.

At the second visit one week later the rubber dam is again applied and the region is swabbed with alcohol and dried. The cement seal is removed with a sterile bur. The pledget of cotton wool is lifted out, exposing the surface of the radicular pulp which, if healthy, will be seen as pink granulation tissue. A soft paste of zinc oxide and eugenol is teased into the pulp chamber and covered with a layer of silicophosphate cement.

The treatment is deemed successful if the tooth is symptomless, apical development is proceeding normally, there is roentgenographic evidence of the dentin bridge and the pulp responds normally to vitality tests.

The highest proportion of successes (92 per cent) occurs when teeth with open apexes are treated within 48 hours of the accident. As the delay in treatment increases, the chance of success diminishes. In 24 of the 33 instances of failure, one or more of the following factors prevailed: (1) long time interval between accident and treatment; (2) inability to use a rubber dam and therefore possible contamination of the field of operation; (3) a fracture line that crossed the gingival attachment; (4) subluxation of mobility of the tooth and (5) profuse hemorrhage from the amputation site.

### Treatment of non-vital teeth with incompletely formed roots

J. A. Englander. *J.D.Med.* 11:90-100 April 1956

One of the most perplexing problems in endodontics is that of treating pulps of teeth whose apexes have not closed fully. Teeth with nonvital pulps and with periapical regions of pathosis can be treated through the root canals only, to pro-

duce regeneration of bone. The most important factors leading to successful endodontic therapy are the complete, thorough débridement of the root canals and the complete obturation of the root canals laterally and apically. Medications used during treatment are secondary to the two major factors.

Mild irrigating solutions aid in débriding the canals. Root canals may be left open (without any dressing) if the patient has pain or if there is an excessive flow of exudate. When the symptoms have subsided, the root canal may be sealed.

Treatments, once started, should not extend beyond two or three weeks. If the response to treatment is poor, as indicated by continual drainage, periapical curettage should be tried. Use of the rubber dam will facilitate treatment. If the rubber dam clamp has no traction on the crown, an artificial crown may be placed to facilitate use of the rubber dam. Periodic examinations should be made to determine the progress of the therapy.

Obturation of the root canal is a difficult process. The filling of choice is gutta-percha. Roentgenographic examination every few months aids in evaluating the progress of the treatment.

When the response to treatment is satisfactory, the canal becomes dry, the patient is comfortable and no complications occur. These treatments usually do not extend beyond six or seven visits, and no surgery is necessary for the success of the endodontic therapy.

**Breaking of instruments during root canal treatment: cause, prevention and removal** (Über das Abbrechen von Instrumenten bei der Wurzelbehandlung: Ursachen, Verhütung und Entfernung)

L. Castagnola and J. Alban.
*Schweiz.Mschr.Zahnhk.* 65:855-861 Sept. 1955

Success of root canal therapy often is impeded by the accidental breaking of an instrument during the treatment.

The Dental Institute of the University of Zürich recently has published statistical material on such accidents. The records of about 2,000 patients were reexamined, and it was established that in 122 (6.1 per cent), surgical instruments broke either during tooth extraction or treatment of gangrenous disease. In instances of root canal therapy (2,992), the percentage of broken instruments was 4.1, mainly in upper lateral incisors, upper first bicuspids (buccal canals) and molars (mesial or mesiobuccal canals).

Of all the instruments used in root canal treatment which were investigated for breakableness, the rotating cutting instruments were the most susceptible to breakage (from 40 to 50 per cent); explorers for locating dental caries (2 per cent), and pulp testers (6 per cent) had the least breakage. Kerr files, broaches and syringes (from 8 to 10 per cent) also experienced much breakage. Funnelshaped, wide root canals and the correct manipulation of instruments will reduce the risk of breakage. Although considerable time may be required to obtain the necessary experience in selecting the suitable instrument and using it correctly, once the technic is mastered, root canal treatment will become an easier task for the dentist. The introduction of high speed diamond instruments of different designs, and of carbide burs in restorative procedures has provided a more efficient method of preparing the cavity and of treating root canals.

When breakage occurs, the removal of instrument fragments by chemical procedures, by magnets or electrosoldering seldom succeeds. If the root canal permits passage, the fragments remaining in the canal often can be dislodged easily and removed completely; the treatment of root canals can then be continued. Fragments which already have passed the apical foramen can only be removed by surgery. The immediate successful elimination of the fragment is an important factor in relieving nervous tension after such accidents for both the patient and the dentist.

In the final analysis, the degree of success in the clinical application of modern high speed instruments depends on the dentist's knowledge of physiologic and mechanical principles, and on his experience in special technics and procedures which, to some degree, have changed all previous concepts in root canal treatment.

Particularly common are the teeth-grinders. The squirrelfish grinds together toothed areas in the back of its mouth, called "gill teeth," and thus generates a sound which is amplified by the adjacent air bladder and becomes a rasping grunt. The parrot fish, rubbing together sets of gill teeth, emits a scratchy crackle. The filefish has front incisors with fine ridges which when scraped generate a loud, metallic rasp. The porcupine

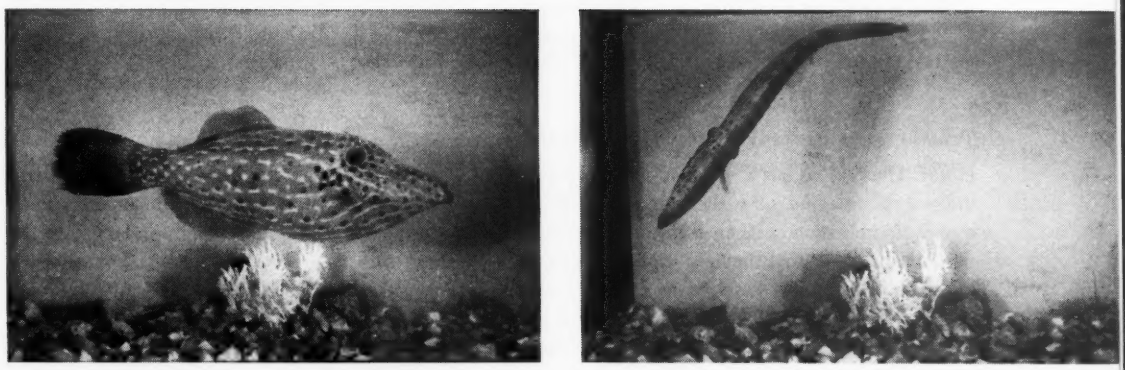

*Figure 1 The filefish grinds its front incisors to generate a loud metallic rasp*

## Animal sounds in the sea

Marie Poland Fish. *Scient.Am.* 194:93-102 April 1956

During World War II the ocean waters were explored widely for the first time with sensitive listening devices. The submarine eavesdroppers heard a bedlam of mysterious beeps, groans, croaks, crackles, whistles and moans. For the past seven years the Narragansett Marine Laboratory at the University of Rhode Island, with the support of the Office of Naval Research, has been studying sea-animal sounds.

Fishes and other sea animals have no vocal organs; they make sounds in diverse and intriguing ways. One group produces sound by vibrating the walls of their ballon-like air bladder, the bladder acting like a soundbox or drum.

A second class of sound-makers produces noises by scraping one body part against another. fish simply rubs together its toothless jaws and generates a raspy whine which sounds like a saw or the creaking of a rusty hinge. This noise may be as frightening to the fish's enemies as its sharp spines.

Sculpins, a family of spiny sea fishes like the fresh-water bullhead, issue a dull, low-pitched drone which suggests the hum of an electric gen-

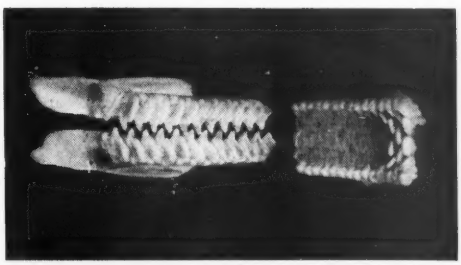

*Figure 2 Pharyngeal teeth dissected out of the parrot fish. When they are rubbed together, they make a scratchy crackling sound*

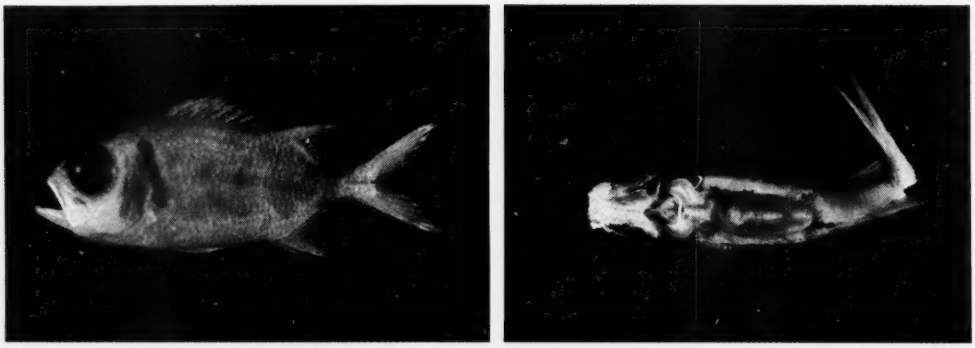

*Figure 3 The squirrelfish makes a rasping grunt by amplifying with an air bladder the sound made by grinding two toothed areas in the back of its mouth. Right: After dissection*

erator. The sculpin has no air bladder, and it was difficult to imagine how the fish produced its sound. Examination of its anatomy and recent experiments suggest that the noise is made by rapid vibration of muscles attached to certain bones of its skeleton.

The most garrulous fish is the sea robin, which keeps up a barrage of grunting and crackling; solitary ones occasionally even "talk to themselves." A tame sea robin in an aquarium clucks softly when stroked, like a purring cat, but if it is handled too much it will break away in seeming annoyance and emit a burst of noise.

Fish apparently make noises for a variety of reasons. They use sound to communicate. Many fish become most loquacious during the spawning season. Around the Malay States they are so noisy that commercial fishermen send divers down to locate schools by ear.

Competition seems to be a common stimulus to sound. The arrival of a natural enemy may move fish to cries of alarm, and if a fight occurs, the sound level rises abruptly and may sound like a mob reaction.

It seems safe to conclude that the din of animal life pervades the underwater world as it does the forests, countryside and cities on land. It is noisiest in the warm inshore waters, but even the deeps of the sea are not silent.

Learning the sea sounds and languages has practical uses. The Navy has found the research helpful for predicting underwater sound conditions in strategic areas, for developing underwater acoustic gear and for training sonar operators. Commercial fishermen use acoustic finders patterned after the Navy depth-finders to locate schools of fish.

**The dentition of the lemurs** (Der Zahnbau der Prosimier)

Ilse Keller. *Wissenschaft.Zschr.Univ.Greifswald* 4:371, 1955

Lemurs (Lemuroidea—prosimian primates) are arboreal, mainly nocturnal mammals which do not come under the designation of either monkeys or apes. Although many types of lemurs resemble monkeys in form and habits, nearly all species have foxlike muzzles, large eyes, and a soft, wooly fur. Their tails, sometimes rudimentary, but usually long and furry, are imperfectly prehensile.

The maximum number of teeth in lemurs is 36. An unusual development of numerous cusps on the crowns of premolars and molars, especially that of an anterior palatal cingulum cusp, was first established on fossils of an extinct prosimian species. These cingulum cusps, a characteristic of many lemur species, seldom occur in man. In the dentition of lemurs and that of humans, however, are many similarities. Both occasionally have a Carabelli cusp, a small tubercle situated on the lingual surface of molars.

In lemurs, the often occurring crowded dental arch causes a compensatory overdevelopment of

the dental ridge, a subsequent widening of the posterior alveolar bone and the formation of comparatively large molars. Such an overdevelopment in dentition has not been observed in monkeys, apes or humans.

▼

## Anthropology

### Comparative human odontology

T. Draper Campbell. *Austral. D.J.* 1:26-29 Feb. 1956

Many aspects of dental science are better understood when viewed in the light of comparative anatomy and physiology. In the past two centuries the food habits of civilized man have changed so substantially and so rapidly that his dental system has failed to cope with the situation. The symptoms of this failure are a spate of abnormalities, maldevelopments and pathologic conditions.

The aboriginal Eskimo and Australian are probably the best examples of modern native groups least affected by the dental ills characteristic of communities with civilized food habits.

The author in 1925 drew attention to the pronounced occlusal and interproximal wear of the teeth of the Australian aborigine. When the aboriginal child acquires his teeth, native food habits make the chewing of his food a vigorous business, producing wear of the teeth with progressive obliteration of cusps and grooves. The progress of occlusal and proximal wear is a natural process in complete reciprocal harmony with the progress of tooth positioning, stabilization and function. The retention of high cusps on the teeth of civilized man produces a vicious cycle of problems for the orthodontist, periodontist and prosthodontist.

Although interproximal attrition has been described by some writers as abnormal, it is a feature of all human dentitions which function naturally, as it is of the teeth of many animals, especially those of herbivorous habits.

It is out of the question that modern civilized man should, or could, revert to the food habits of the aboriginal Australian or Eskimo; but some convincing and valuable lessons are to be learned from a study of their foods and food habits. Any steps to re-establish vigorous natural mastication must bring about a reduction in dental lesions and induce favorable digestive reflexes.

Comparative human odontological studies provide an insight into basic principles of dental anatomy and physiology, increase one's knowledge of the fundamental function of the natural human denture, and have a bearing on the correct approach to treatment of the dental troubles which afflict civilized man.

### Missing third molars in Mexican aborigines (Fehlende dritte Molaren bei Mexikos Eingeborenen)

Ernesto Cohn, Puebla, Mexico. *Bl.Zahnhk.,Zürich* 17:35 March 1956

Mexican and foreign dentists, examining full-blooded Indians, have observed the absence of third molars in more than 90 per cent of the patients. Retention or impaction seemed to be the only plausible explanation.

Serial roentgenographic examination of a large group of Mexican Indians revealed, however, that not only the third molars were absent but that no dental germs of those teeth existed.

The Indians, coming from various districts, all explained that they had never heard of third molars, and that no Indian they know possesses such a tooth.

In the Mexican dental literature, this phenomenon is neglected.

Around 1700, the Spanish dentist, Léon, wrote that in all Indians examined he had observed the absence of upper second bicuspids which were replaced by first molars that had shifted into their position. Léon's examinations and his explanation obviously were erroneous. In all Indians recently examined, the upper second bicuspids were present but the third molars were missing in both jaws.

Until further intensive study is made, the hypothesis that the absence of third molars in Mexican aborigines is a stigma of degeneracy can neither be denied nor verified.

## Metallurgy

**Metallurgy of silver amalgam** (Metalurgia de la amalgama de plata)

R. Acuña Ortiz. *Rev.dent.Chile* 45:763-768 Sept.-Oct. 1955

The various metals that constitute the alloys for dental amalgams have been analyzed from a metallurgic point of view.

Silver is the skeleton of the alloy of dental amalgam in that it constitutes at least 65 per cent of the alloy. It has a great affinity for mercury with which it combines in definite atomic proportions. The greater the amount of silver in the alloy, the quicker the hardening of the amalgam. Silver dilatates at the same rate that tin contracts (a dilatation and contraction coefficient of 1.4 per cent respectively). If silver predominates in the alloy, dilatation of the amalgam occurs. This dilatation can be neutralized by adding tin to the alloy.

Silver increases the mechanical resistance of the amalgam filling. It oxidates when it comes in contact with the chemical substances of the mouth and forms sulfides, which often cause dark discoloration of the fillings.

Tin is present in the alloy in a proportion of 25 per cent. It has great affinity for mercury with which it combines in all proportions. It delays hardening of the amalgam, neutralizes dilatation of silver, prevents oxidation of it and discoloration of the fillings, gives great plasticity to the amalgam, and, when it is combined with silver, lessens the reactions of heat and cold.

An amalgam of tin and mercury cannot be used because of the high power of contraction and the lack of mechanical resistance of tin.

Copper is present in balanced polyternary amalgams in the amount of 6 per cent at the most. It combines with mercury with difficulty and in definite proportions. It increases the tenacity of the alloy and gives great resistance to the surface of the fillings. It lowers the fusion point of the alloy, has bactericidal properties, acts as an antiseptic on dentin, increases expansion of the amalgam during condensation, diminishes flow and increases mechanical resistance to mastication. It causes dark discoloration of the fillings.

Zinc may be added to the alloy in the proportion of 2 per cent at the most. The function of zinc in the alloys is obscure. Alloys without zinc produce amalgams with filling qualities that are as good as those of amalgams of alloys prepared with zinc.

The mercury used in the preparation of dental amalgams should be chemically pure (distilled two or three times). Any impurity diminishes the affinity of mercury for the other metals in the alloy. Mercury is incorporated in the alloy in a proportion that is almost equal to that of silver. Copper, zinc, tin, bismuth and many other metals added to mercury even in a proportion of 0.001 per cent may result in superficial contaminations. Possible adulterations of mercury should be detected prior to the use of the metal in the alloy. At first sight, adulterated mercury has a dull aspect. A simple test to detect this adulteration is to drop a few drops of mercury on a smooth glass surface. If foreign metals are present in the mercury, minimal traces of them will stick to the glass surface. A test has been developed to determine adulteration of mercury by lead.

The aforementioned metals constitute the alloys of quinary dental amalgams of silver.

Gold, platinum, palladium, cadmium, bismuth and antimony are sometimes added to polyternary alloys. Gold is added in a proportion of 2.5 per cent. It increases the malleability, hardness and resistance to corrosion of the amalgam and improves the color of the fillings. Platinum is added in a 0.5 per cent proportion. It increases ductility, malleability and tenacity and contributes to the white color of the alloy. Palladium is added in very small proportions. It hardens quickly and is hard to manipulate. It improves the white color of the alloy. Both platinum and palladium increase the fusion temperature of the alloy. Cadmium is added to give the white color that is proper of tin. It has great malleability and hardens rapidly. Bismuth is very expansive. It is rarely used as a chemical constituent of amalgams, which it transforms into sticky dough. Antimony, when it is used, is employed in very small proportion. It gives great hardness to the amalgams.

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Anatomy

## Inflammation of the lymphatics of the face secondary to dental infection

D. A. Dixon. *D.Practitioner* 6:63-67 Oct. 1955

The lymphatic nodes of the face, although small and inconstant, share with the rest of the lymphatic system a liability to infection and inflammation. A knowledge of their anatomy and pathology is important to the dentist in the diagnosis of inflammatory conditions of the mouth.

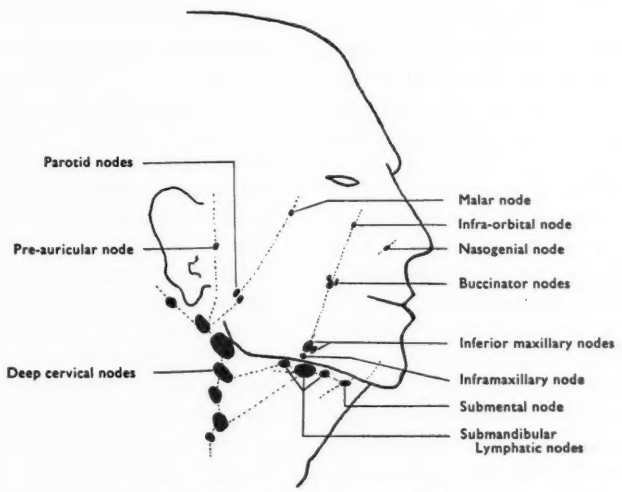
Three cases are reported in which it is considered that an inflammation of the facial lymphatic tissue had occurred secondary to infection of dental origin.

The lymph nodes of the anterior part of the face or cheeks fall into three groups: (1) the superior group comprising malar, infra-orbital and nasogenial nodes, each or all being only occasionally present; (2) the middle group consisting of the buccinator nodes, which may themselves be split into three groups by the relationship of the facial artery and vein, and (3) the inferior maxillary group beneath the skin on the external surface of the mandible, anterior to the border of the masseter muscle and in close relation to the facial artery and vein.

The inferior maxillary group is sometimes related to the submandibular nodes by an infra-maxillary gland described by Buchbinder (1899). The infra-orbital, buccinator and inferior maxillary nodes, if present, are positioned near the course of the anterior facial vein and form a pathway of lymphatic drainage from the cheeks.

MacGregor (1936), in an investigation into the lymphatic system of the teeth and jaws of various animals, traced the lymphatic vessels from the teeth and deeper structures. These vessels emerge from the mental foramen and the foramens in the infra-orbital region and travel parallel with the anterior facial vessels to the submandibular nodes. It is probable that a similar arrangement is present in the human. If this is so, the accessory lymph nodes in the cheek occasionally will show inflammatory changes similar to those of the submandibular nodes in instances of dental infection.

The pathology of such instances, and the differential diagnosis, are discussed.




*Arrangement of the lymph nodes of the face*

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## Pathology

### Precancerous conditions and carcinomas in the oral cavity

(Die Prekanzerosen and Karzinomas der Mundhöhle)

F. Moser. *München.med.Wschr.* 97:1118 Aug. 26, 1955

Precancerous alterations of the mucous membrane occurring in the oral cavity usually are sequels to different primary diseases such as specific forms of leukoplakia, tertiary syphilis, lupus, pityriasis rubra pilaris and lichen sclerosus et atrophicus.

Leukoplakia is characterized by a slow development of white, thickened patches of variable size and irregular outline which may be distributed either on the buccal mucosa, the tongue and the palate or on all three. These patches frequently tend to fissure. Microscopically, the entire layer of the epithelium is considerably thickened, keratinization is extensive, and the interpapillary epithelium is extended downward. The connective-tissue papilla is infiltrated with lymphocytes, plasma cells, large mononuclear cells and occasionally with polymorphonuclear cells.

Usually, leukoplakia appears in middle-aged men; it is comparatively rare in women. Nearly all patients are heavy smokers, especially pipe smokers, and often cessation of smoking results in recovery. Contrary to many reports, syphilis is not a causative factor. Occasionally, however, leukoplakia may undergo malignant degeneration.

Etiologically, the causative factors may be of external or internal (dispositional) origin.

Clinically, an extreme inclination to severe cornification is significant.

No adequate statistical material is available on the frequency of the transformation of leukoplakia into true carcinoma. The change from precancerous formation of lichen into carcinoma has been reported frequently. Carcinomas in both lupus and syphilis occur often. The gradual transition from the precancerous to a malignant condition occurs in four stages.

Squamous cell carcinoma is the most frequent tumor of the mouth. Transitional cell carcinoma is rare. Often there is a relation between oral carcinoma and fractured teeth or poorly fitting dentures. Carcinoma of the lip occurs more frequently on the lower than on the upper lip, and usually is of a well differentiated squamous cell type. Metastases often are observed but they are seldom widespread. Carcinoma of the mucous membrane in the oral cavity is characterized by an infiltrative development into the lymphoid tissue of the nasopharynx which lies over the epithelium. The prognosis is favorable only when the neoplasms are small and involve neither the glands nor the periodontium.

Therapy consists in radium beam treatment and short distance, low voltage roentgenotherapy. If the jaws also are affected, a partial or total resection will be necessary (even though the palpation test is negative).

Whether the patient with cancer in the oral cavity will live often depends solely on the alertness of his dentist or physician during periodic examinations. Most patients prefer to consult their dentist rather than the physician when the symptoms appear in the mouth.

### Herpangina (A herpangina)

Pal Oravecz. *Fogorv.szemle* 49:16-19 Jan. 1956

Herpangina is a specific febrile disease of children, which manifests itself by minute papules, vesicles of the floor of the mouth and by ulcers in the throat. It usually originates in inflammations of the submaxillary glands and lymph nodes and often complicates dental infections.

Suppuration usually occurs but phlegmon and gangrene may supervene. Frequently edema of the glottis accompanies this disease.

Nearly a third of the children affected with herpangina die in spite of treatment.

In the summer of 1954, at the Pediatric Clinic of Pecz, Hungary, 18 children suffering from herpangina were observed. As causative factors, isolated serologic types (A2 and A4) of *Pseudo-*

*monas coccacea Migula,* small bacterium-like pleomorphic organisms, were established. Under Giemsa's stain they appear reddish-purple, under Macchiavello's stain, bright red against a blue background. These organisms are gram-negative.

An injection into newly born rats of mucous discharge taken from the children produced herpangina.

This disease is highly contagious, and dentists encountering herpangina must sterilize all instruments and implements, especially in pedodontic practice.

### Tobacco and the oral mucosa

(El tabaco y la mucosa oral)

Miguel Sáenz de Pipaón y Tejada. *Odontoiatría, Madrid* 12:619-621 Oct. 1955

Individual susceptibility to or excessive use of tobacco produces changes of the oral mucosa.

The mucosa, especially of the dorsum of the tongue, absorbs nicotine, which is soluble in saliva. This alkaloid, by its action on the nerve endings of nonstriated muscle fibers, produces ptyalism, thus increasing the solubility of the nicotine.

Nicotine is an active vasoconstrictor, and the resultant spasm of peripheral blood vessels leads to trophic changes, paresthesia and pain. The oral mucosa reacts to this with gingivitis, hyperesthesia of the tongue and taste disturbances. Epithelial changes, beginning with hyperplasia, are followed by hyperkeratosis, then leukoplakia, keratosis, and finally the initial stages of carcinoma.

Though the malignancy of oral lesions is not caused directly by the nicotine content of tobacco, it is clinically evident that leukoplakia buccalis will only heal when tobacco is abandoned completely.

Nicotine is rapidly absorbed by the oral mucosa, especially the tongue. It is eliminated by the lungs and kidneys, also by the placenta, and in a lesser degree by the mother's milk. Therefore, smoking should be avoided during pregnancy and lactation.

### Significance of bleeding gums

Editorial. *J.A.M.A.* 160:1056-1057 March 24, 1956

Periodontal disease is by far the major cause of tooth loss in persons over 35 years of age. Inflammation of the gingiva is present to some degree in most persons who eat chiefly soft and cooked foods. Local irritation of the gingiva is almost always the primary cause of bleeding of the gums, although occasionally some underlying systemic factor may cause bleeding in the absence of local irritation.

It is a common mistake to consider every gingival hemorrhage as a manifestation of uncomplicated gingivitis or periodontitis. The bleeding may be a sign of serious general disturbance, such as scurvy, pellagra, diabetes, leukemia, agranulocytosis, hemophilia, thrombocytopenic purpura, pregnancy, allergy, or lead, bismuth or mercury poisoning. If the bleeding persists for several months, complete medical studies supplemented by a dental survey that includes a full set of oral roentgenograms should be undertaken.

Local treatment by the dentist can correct the mouth condition if there is no underlying systemic disturbance. Although removal of the local irritating factors may not re-establish normal gingival and periodontal health while an underlying systemic disturbance remains uncorrected, it is virtually impossible to achieve permanent remission by treatment of the systemic factor alone. Prescription of vitamin supplements as the sole treatment for bleeding gums is irrational and ineffectual.

Despite repeated admonitions to "see your dentist twice a year," a physician cannot take for granted that his patients, even those with the most urgent need to consult a dentist, have done so. The physician can best serve his patient at times by recommending a dental survey, and the dentist can often reciprocate in that he may be the first to have an opportunity to observe evidence in the oral cavity of conditions that require a complete medical check-up. The idea of treating the patient as a whole sometimes must include dental service as well as medical attention.

**Professional activities**

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Practice administration

## The approach to the ideal dental office

Thor Hesberg. *J.South.California D.A.* 24:31-34 April 1956

Dental offices should be designed to meet the specialized needs of modern dental practice. The office should reflect the high standards of modern dentistry, and should compare favorably with the progress of other professional and commercial structures as to function, economy, comfort and distinction.

The architect author presents a design for a general practitioner's office with an associate dentist, hygienist, three nurses and two technicians. Architectural requirements were determined by interviews with hundreds of dentists and observation of dentists and their employees at work.

Free circulation, supervision, the saving of steps and a logical sequence of rooms suggested a central nurses' and administration area. Daylight everywhere is achieved through the free use of glass, half high walls, planter walls and sky domes. The operatories are shaped to fit working and walking areas, and to provide for bench niches and closets. Doors are located in the direction of outgoing traffic.

Automobiles parked at the entrance are not visible from the interior of the building. The coffee room provides private access and outdoor relaxation. A combination x-ray and examination room is adjacent to the operatories and dark room. The hygienist's operatory has a private desk. The two private offices share a common lavatory and shower. The air-conditioning equipment is located in a penthouse over the janitor's room.

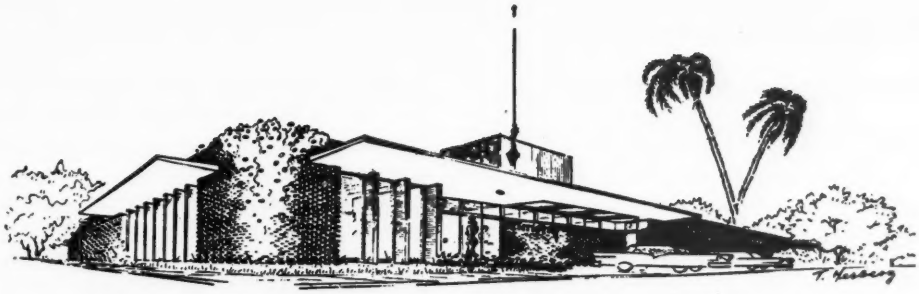
Supervision is possible in all directions from the central offices. All rooms are located in a logical sequence and distance from the lobby and reception room.

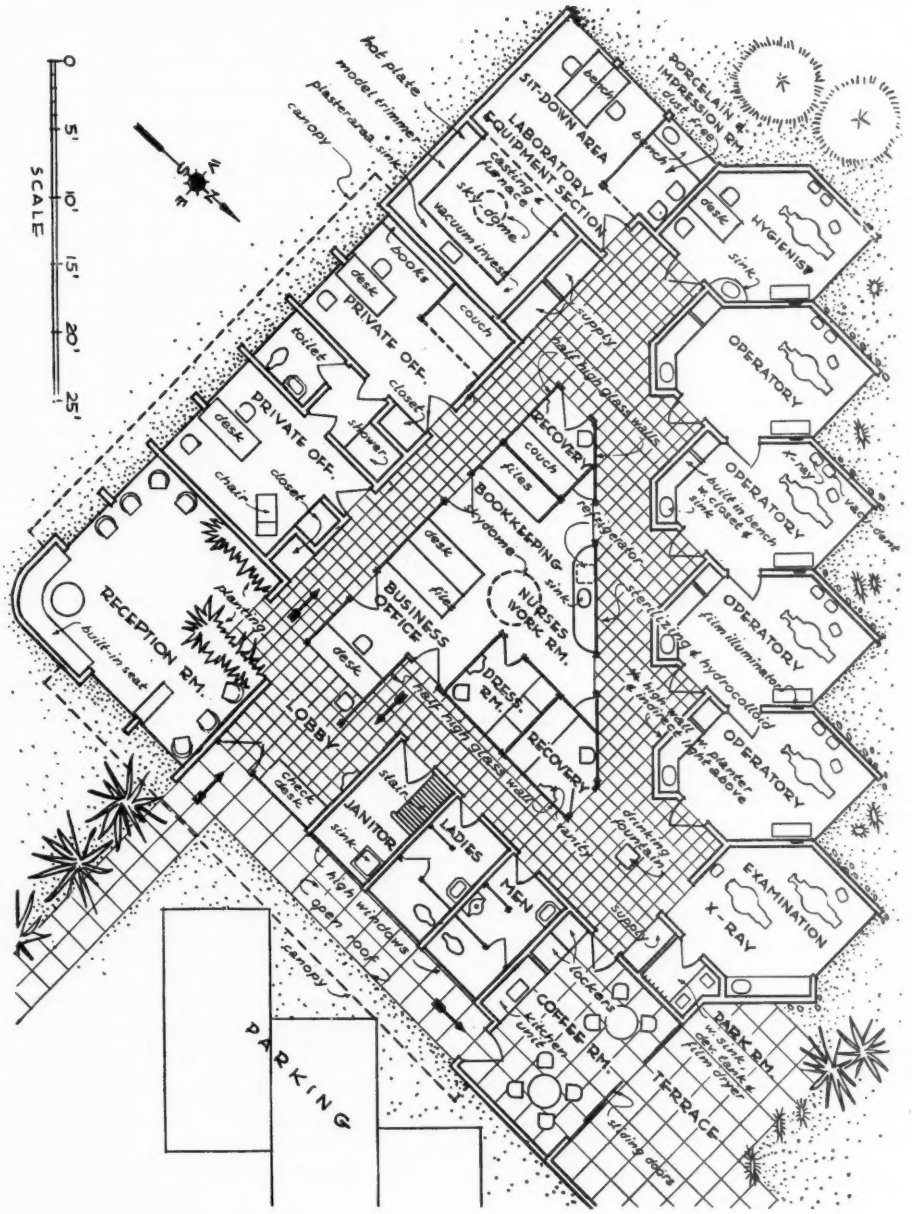
In the operatories, equipment is placed to afford maximum utility. There is gracious work space surrounding the chair and gracious traffic space at the entrance. Soundproof doors are placed between the main operatories. The floor to ceiling north windows overlook a landscaped scene.

In the laboratories, the principal functions are separated, with a U-shaped equipment section, a sit-down area and a combination porcelain and impression room. Furnaces are at eye level above the casting well. The area for vacuum investing has adequate bench space and a sink. A separate plaster area has a sink and plaster filter trap. The built-in hot plate unit is vented to the roof.

In the nurses' work room and administration offices, half high walls and a free use of glass convey a feeling of spaciousness. The nurses' dressing room is adjacent to their working area. The executive secretary is isolated from traffic. Direct daylight from a skydome and indirect daylight through the surrounding rooms are combined. A chair at the business counter and a check desk with telephone in the lobby contribute to the patient's comfort.

*Opposite page: Plan showing graciousness in space combined with concentration of functions and logical circulation around a central nurses' and administration area*

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SIT-DOWN AREA
bench
PORCELAIN & IMPRESSION RM.
dust-free
desk
HYGIENIST
sinks
OPERATORY
supply
half high glass walls
PRIVATE OFF.
desk
books
couch
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closet
shower
PRIVATE OFF.
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chair
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RECOVERY
couch
files
BOOKKEEPING
sky-dome
desk
file
BUSINESS OFFICE
desk
RECEPTION RM.
planting
built-in seat
LOBBY
check desk
stair
JANITOR
sink
LADIES
MEN
high windows
green roof
canopy
PARKING
refrigerator
NURSES WORK RM.
sink
DRESS. RM.
half high glass walls
RECOVERY
family
drinking fountain
lockers
COFFEE RM.
kitchen units
sliding doors
TERRACE
OPERATORY
built-in bench
sink
closet
X-ray
wash-dent
OPERATORY
film illuminator
sterilizing & hydrocolloid
high cabinet for planter above
OPERATORY
EXAMINATION
X-RAY
DARK RM.
wash sink
film dryer

### The management of orthodontic practice

Alexander Sved. *Am.J.Orthodont.* 42:328-340 May 1956

An efficient system of keeping records and arranging appointments is the backbone of a successful orthodontic practice. Each year the number of patients attached to the office becomes larger; unless this is recognized in advance and provisions are made to cope with the problem, the practice becomes saturated and the quality of service deteriorates.

It is physically impossible to conduct an orthodontic practice after school hours. Parents and school authorities must be enlightened on this point.

A record system is described which results in proper care for all patients.

When a patient comes for consultation, the parents fill out a "white card," with the necessary names, addresses and telephone numbers. For the patient who has arranged for treatment, a salmon-colored card is made out and filed in the active file which contains records of only those patients who receive active treatment or who are under retention or observation.

The patient is given a number when impressions and roentgenograms are taken. These numbers are entered consecutively in a book, with the name of the patient.

The history of the patient is recorded on a chart.

Two sets of impressions are taken, one poured in plaster as a record, the other made in stone for the making of molar bands. From these models, a drawing of the arch form is made and filed, together with a band chart which is valuable in determining when a band should be recemented.

A specially designed appointment book shows the six working days of the week. The first and third weeks are reserved for the construction of appliances, taking of impressions and for those regular patients who cannot be accommodated during the second and fourth weeks, which are reserved exclusively for the treatment of active patients.

A special work sheet was devised on which the patients whose bands are to be recemented are distributed in such a way that no more than two patients have their bands removed during the morning, and no more than two during the afternoon.

To locate the appointment of an observation or retention patient, a separate visible card system is maintained with a card for each patient, on which all appointments are recorded.

With this system of records, the author treats more than 400 patients who must be seen at regular intervals.

### Correct practice administration

G. Archanna Morrison. *Massachusetts D.Soc.J.* 5:23-25 April 1956

Correct practice administration has the following goals: (1) to control operating costs through conservation of productive time, patient education and sound collections; (2) to improve public relations through patient education and practical office policies, and (3) to help dentists live longer and healthier lives by delegating all possible duties to auxiliary personnel.

Good practice administration is based on the secretarial department. The secretary's desk should be placed so that the secretary is seated facing the patients. A stall or bar built across the front of the desk and rising about 12 inches above the desk surface gives added privacy to the desk. A counter shelf can be built across the stall to provide space for a patient to place a handbag. Pigeonholes for appointment cards and educational literature for the patient can be arranged on the inside of the shelf. A name plate for the secretary adds dignity and prestige to her presence.

The appointment book should be kept by one person. Patients requiring services that involve substantial mental and physical energy should receive morning appointments.

The patient will welcome an appointment card confirming his reserved time. It is an advantage to use colored appointment cards and statements. An effort should be made to schedule a patient for the same day each week.

No fee should ever be quoted over the telephone because a professional fee is influenced by

the knowledge, technic, mental strain and responsibility involved.

Every patient comes to a dental office to receive one or more of these benefits–improved health, appearance, self-confidence, success and happiness. The dentist should discuss with each patient what services are necessary to accomplish the desired results, and the investment to be made by the patient to obtain such results.

Valuable educational material for patients is available from the American Dental Association; an ample supply of this literature should be in every reception room and in a rack near the operatory chair. Pertinent dental literature should be available for expectant mothers and for parents.

A monthly organization or staff meeting is necessary, and should be set up on the appointment book, as are the dates for dental meetings and other important events.

### Cleanliness in the dental office

M. C. and J. T. *J.Ontario D.A.* 33:19-20
April 1956

Cleanliness is more important in dentistry than in any other profession. Everything in the dental office must be immaculate. Patients will not tolerate a lack of cleanliness, and the dentist who disregards this fact will fail.

The dentist should wear a clean gown, preferably with short sleeves, neatly pressed trousers and polished shoes. He should be clean shaven, have clean teeth, have no halitosis or tobacco breath, and have short, well-trimmed nails.

The hands should be washed and scrubbed with a nail brush in the presence of the patient before beginning to operate and each time the dentist is called away and returns to the patient. The dentist should avoid touching his hair, face or clothing while operating. If he is developing a cold he should wear a mask. The nurse or dental assistant must be as clean and neat in appearance as is the dentist.

The cotton waste dispenser should be changed between patients, and the contra-angle handpiece should be sterilized in oil. Steel burs should be soaked in a cold disinfectant, cleaned with a wire brush and resoaked in cold solution; carbide burs should be autoclaved or boiled after being cleaned; prophylaxis brushes should be washed, cleaned and cold sterilized. Water and air cutoff tips, and the glass for the water syringe, should be changed and sterilized between patients. It is advisable to use disposable paper cups, towels, napkins, wipers, tray covers and headrest covers. The cabinet top, unit, light, chair and sink should be thoroughly cleaned at least once a day. The top of the cabinet should contain nothing but the necessities.

The operating room floor should be swept or vacuumed twice a day and the whole office aired often during the day. The reception room should be noticeably clean; outdated, torn and dirty magazines should be removed, ash trays should be clean, the furniture dusted and the floor cleaned as often as necessary. The desk in the business office should have only an appointment book, memorandum pad, pen and pencil in sight. The laboratory and darkroom should be kept clean.

Cleanliness is the soundest investment a dentist can make.

### The "peace of mind" room for doctors

T. A. Garrett. *Chicago Tribune* 115:3
June 17, 1956

Interior designers plan decorative schemes from many standpoints–beauty, comfort, utility, style, convenience, and several others–but one important aspect often is overlooked, a room, a corner, for plain relaxation.

A room, specifically designed for the relaxation of dentists or physicians, called "ataraxia" (taken from the ancient Greek word "ataraktos," meaning peace of mind) was exhibited at the convention of the American Medical Association at Chicago's Navy Pier. During the convention, the room was used as a place for visiting physicians to rest both their minds and their feet, as well as a source of ideas for anyone seeking a relaxing atmosphere.

The "ataraxia" room was assembled by a staff of experts in decorating, lighting, sound conditioning, air conditioning and color schemes.

The value of music, the part color plays, the advantage of air conditioning and other aspects of mental and physical relaxation were considered in planning this room.

It had a quiet, cool color scheme of greens, blues and light gray with occasional flashes of bright colors to offer relief. The walls were blue-green; the carpet, a tweedy "twilight" mixture of brown and green, and the draperies, two shades of green in a block print on mohair. A three-piece Nile green sectional sofa and chairs of moss green and gold were selected to contrast with other chairs in tangerine and persimmon.

White matchstick blinds were at the windows, one of which had a "view" of a mountain scenery. A walnut planter, seven feet long, provided restful greenery. The tables were walnut, some with mosaic tile tops.

Upholstery fabrics were tightly woven and smooth, as was the drapery fabric; contrast and cushioning were provided by pile carpeting. Modern Danish lighting fixtures were suspended from the ceiling for a soothing general illumination, and tall ceramic base lamps from Italy furnished proper light for reading and studying.

The ceiling was covered with acoustic tile for sound absorption. A high fidelity installation played appropriate background music.

Paintings and objects of art were provided by the Art Institute of Chicago to create a balance of active and rest areas.

Such a room might serve as a prototype for other such "peace of mind" rooms in homes and offices of dentists and physicians.

**Is dental economics a basic subject:**
(La economia dental. ¿Es una asignature basica?)

Marcelo Friedenthal. *Rev.A.odont. Argentina* 44:47-49 Feb. 1956

Only 30 years or so ago, the discussion of dental economics was frowned on, and if any student had dared to bring up the subject of dental fees, he would have been told to devote himself to learning to work well, and the fees would take care of themselves. The proper organization of professional life, however, requires a consideration of its economic aspects and for some time now dentists of good judgment and the highest ethical sense have given lectures on dental economics and have published articles advising readers how to practice their profession efficiently and at the same time to obtain a reasonable return for their services.

Instruction in dental economics is necessary, because it will save long years of groping for the best methods, enable young dentists to avoid gross errors in the management of their practices, and establish a harmonious relation between their private and professional lives. Undoubtedly, a student who has learned to care for clinic patients as he will have to care for the patients in his own office, making a thorough examination and an efficient roentgenographic study and planning the appropriate treatment, will be better prepared for practice than one who merely carries out instructions. Similarly, the student should learn by experience the difference between working with good, well-kept instruments and those that waste time and occasion technical difficulties because they are in poor condition or are defective in quality.

Two students, under the plan of study recommended by the author, will work together, one as operator and one as assistant, so that both can learn how good assistance can save a dentist time and effort and enable him to concentrate on the major problem before him. Time records should be kept and losses of time rigorously analyzed so that they can be avoided and so that the relation of time to fees can be properly understood; in particular, stress should be laid on loss of time due to imperfect preparatory work, that is, poor impressions. The value of anesthetics in relieving the patient's anxiety and saving the dentist's time and increasing his efficiency should also be brought out. Finally, the student should learn how to instruct his patients in regard to the condition of their teeth and its repercussions on their general health, and he should be taught the advantage of long appointments, which save time when judiciously arranged.

Many dentists now in practice would have benefited greatly by timely instruction of this kind; those about to graduate and enter professional life will find themselves much better able to succeed in practice if they receive it as part of their training.

## ▼ Trade and laboratory relations

### Tasmanian dental technicians' bill

*Austral.D.J.* 1:67 Feb. 1956

Rejection by the Tasmanian Legislative Council of a Government move to allow dental technicians to have direct dealings with the public has effectively preserved once again the high standards of the profession in Australia.

This move, one of a number which have originated in recent years to grant dental technicians the right to practice certain phases of prosthetic dentistry, was opposed by the executive officers of the Australian Dental Association and by the faculties of dentistry in all Australian universities. A deputation from the profession addressed members of the Tasmanian Legislative Council.

A letter to the Tasmanian press signed jointly by the deans of all the faculties of dentistry in Australia directed public attention to the evils of permitting unqualified and untrained persons to perform any oral services. The letter was the subject of much editorial comment.

### The training of dental technicians

N. Sällström, Gothenburg, Sweden. *Internat.D.J.* 6:1-14 March 1956

The vocation of dental laboratory technician is relatively new, stemming generally from the latter half of the last century. All the work connected with a dentist's practice originally was carried out by the dentist and his pupils. With the advent of special training schools and colleges for dentistry, dentists began to need assistance with the technical procedures in the laboratory. Dental laboratory technicians served the dentist by making dentures and artificial teeth in the laboratory and under the guidance and supervision of the dentist. Gradually there developed the new craft of dental laboratory technician.

The line of demarcation between the work of the dentist and the dental laboratory technician was vague. In some instances the dental technician was permitted to carry out work on the patient, such as fitting new teeth or color selection. A number of technicians began treating patients on their own. In most countries, many years passed before laws and regulations were passed defining the position of the dental laboratory technician in dental practice. Dental treatment of patients generally has been reserved for the dentist. The trend everywhere today is toward permitting the treatment of patients only by qualified dentists who have graduated from an approved school of dentistry. Countries where dental treatment of patients by the technicians was permitted, such as Germany and parts of Switzerland, have begun to abandon this system.

As dental laboratories grew in number, they frequently grew in size and became more commercial. In large laboratories the work has been increasingly rationalized, with the introduction of piecework and production line methods which in turn have led to a deterioration in the quality and standards of dental technology. The old order of things, with a trained technician working side by side with the dentist in his laboratory, is the best. Only the dentist is responsible for all the work carried out on a patient; he should be in a position to supervise the technical side of the work.

In Sweden the greatest advances have been made in regulating the position, status and training of technicians. In 1944 a one year training course for dental technicians was organized at the Dental Institute at Stockholm, now the College of Dental Surgery. In 1952 a law was passed according to which only dentists were permitted to work in a patient's mouth, but they were allowed to employ dental laboratory technicians to do the purely mechanical work. The technicians were placed under the supervision of the highest medical authority, the Board of Health. In 1947 Parliament decreed that the training of dental laboratory technicians was to be undertaken at schools of dental technology organized and run by the state, which should be attached to the colleges of dental surgery and placed under their direct supervision. Three schools were opened. Anyone now adopting dental laboratory technology as a vocation must first have two years of preliminary training at some working center

recognized by the Board of Health. The pupil may then apply for entrance to one of the state schools. The one year state training course embraces dental anatomy, materials, complete and partial denture prosthesis, crown and bridge work, porcelain technic and orthodontic appliances.

The training is concluded with a one year probationary period in any of the training centers, after which the student may apply to the Board of Health for recognition as a certified dental laboratory technician. This enables him to seek employment at some state dental center. This uniform and state-supervised instruction is a long step in the right direction.

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## History

### Taggart ghost rides again

Editorial. *Bul.Greater Milwaukee D.A.* 22:38-40 April 1956

A recent announcement that William H. Taggart was to be honored posthumously for his contribution to dentistry has stirred bitter memories in Milwaukee.

In 1907 Taggart had obtained a patent on making cast gold inlays. The patent was presented to J. N. Crouse, then head of the Dental Protective Association which had successfully fought the Goodyear rubber patent and the International Tooth Crown Company patent. With the support of Crouse and the Dental Protective Association, licenses to make cast gold inlays by the Taggart process were sold to many dentists. Owners of the patent boasted, "We have the dental profession tied up in a knot. . . . All the leaders and men of standing in the profession have become our licensees, and have signed an agreement not to join or help in the litigation of these patents while they are in force."

The first skirmish in the inlay patent litigation took place in Washington, D.C. Milwaukee dentists went to Washington to fight Taggart, and he lost. Taggart and his attorneys launched a new suit, against Moll in Chicago; in 1913 Taggart won a judgment against Moll for $1,857.50. The patent owners then sent letters to dentists in Chicago and its vicinity, demanding $150 or threatening suit and injunction within five days. Those who did not pay promptly had to pay the $150 plus a $100 penalty.

Dentists formed the Dentists' Mutual Protective Alliance to fight Taggart, who replied by bringing suit against all the officers and members. Some 525 men were sued. The Alliance forced the suspension of all but 13 suits against 13 men. Attorneys for the D.M.P.A. traveled 26,000 miles in 15 states searching for witnesses. J. Schottler, of Milwaukee, was one of the key figures, as he had presented an inlay clinic at the Wisconsin state meeting in 1904.

The trial lasted 30 days, during which nearly 100 witnesses were examined. Judge Geiger ruled that the Taggart patents were invalid, that other dentists had made cast gold inlays by the same process long before Taggart, and that he had no right to his patents.

A man should receive recognition for his contributions to his profession. No man should be eulogized who sought to enslave his profession for financial gain. Taggart had a right to patent his casting machine but not the process.

### Utrecht dental museum: interesting exchange proposal

F. E. R. de Maar, Utrecht. *D.Delineator* 7:14-15 Spring 1956

The Utrecht School of Dentistry in Utrecht, Netherlands, has begun to re-establish and extend its dental museum. A large collection of historically important instruments, materials and installations has been assembled. Included are historical documents on the history of dental teaching and training, diplomas of 1864 and 1867, x-ray apparatus, instrument cabinets, chairs, wall units, a suspension dental engine, a pedal polishing lathe, a diathermy apparatus and others.

Between November 1953 and July 1955 donations were received from 96 institutions and

private persons. More than 2,000 different specimens and exhibits were collected.

The Utrecht museum possesses a stock of 95 old dental chairs of the Morrison Long Range type manufactured in America in 1872. Any other dental school or museum can obtain one of these chairs, provided that some other interesting dental exhibit is offered in exchange.

The first dental museum in Utrecht was begun by T. Dentz, a lecturer in dentistry at Utrecht University, in 1877. Eventually the museum specimens had to be stored in various lofts, to provide more space for educational purposes.

Since 1955 the author, curator of the new museum, has been devoting full time to gathering a collection which will form a complete picture of the way in which the science and art of dentistry has developed to its present state of excellence.

## ▼ Education

### Medical and dental training in the Soviet Union

G. R. Graham. *German M.J.* 1:35 Jan. 1956

In czarist Russia there were not more than 20,000 practicing physicians and dentists. Now, more than 300,000 fully trained practitioners serve in the U.S.S.R.

All the republics of Soviet Russia provide an identical medical and dental training program. Dentistry, however, is regarded as one of the special branches of medicine.

At the end of two years study at medical or dental institutes, the students have to pass an examination toward selection of the most able graduates who will be allowed to continue their professional studies. These students are given a free choice of three main subjects: (1) therapy and prophylaxis; (2) public health and hygiene and (3) any special branch of medicine such as gynecology, obstetrics, pediatrics, surgery or dentistry and its special branches. After final examination, the young graduate (M.D.) is assigned for internship to a hospital or outpatient clinic anywhere in the Soviet Union for at least three years. During this time he is under constant supervision of the Russian Ministry of Health.

At present, in the U.S.S.R. exist 63 medical, 4 dental and 8 pharmacologic schools which admit about 26,000 students yearly, more than half of them women. To most of the medical schools, independent dental institutes are attached.

Because of the scarcity of physicians and dentists, the regulations in regard to admission to medical or dental schools have been relaxed recently. More than 90 per cent of all students now receive government grants. All are exempt from military service before graduation.

Students who desire to pursue an academic career or those who intend to join the national public health department are sent to special postgraduate courses.

After three years of such a special training, the graduates have to submit and publish a thesis. After passing various strict examinations, they become Candidates of Medical Science.

Future academic teachers then have to attend specialized courses for an additional period (at least three years), and have to submit another original thesis. The title "Professor" is conferred not by the universities or medical (dental) institutes but by a special committee of the Ministry of Health.

### Present-day elective and required conditions for studies in dentistry in the Italian Republic (Condiciones actuales obligatorias y facultativas de la enseñanza de la odontología en la República Italiana)

S. Palazzi, Milan. *An.españ.odontoestomat.* 15:3-6 Jan. 1956

The Italian law requires the possession of an M.D. degree for the practice of odontostomatology. This law was passed in 1900 but is still unchanged. It permits physicians and surgeons to practice the specialty provided that during the fourth, fifth or sixth year of medical school they take a theoretical examination on dentistry and complete a course of 25 theoretical lessons on the

subject. Many dentists practicing today, however, have had postgraduate studies in dentistry before beginning to practice the specialty. Persons who plan to become dentists also prefer to take postgraduate studies of specialization.

There are several schools of postgraduate studies in the various specialties; they are part of the university medical schools. The course leading to the diploma of specialization in dentistry is a two year course. The requirements for admission to these schools are the following: (1) an application must be made to the dean of the school and (2) the applicant must have an M.D. degree. In some schools, not in all, an examination in dentistry and on the general knowledge of medicine and surgery is also required. There are no laws of the Ministry of Public Education governing the organization of postgraduate schools, which are organized according to the special regulations of each school.

Reforms are needed, among them the following: The study of medicine should be restricted to four, rather than six, years. At the end of the four years the candidate would receive an academic diploma which would not enable him to practice medicine but which would be the requirement for taking courses to specialize in any one of the various specialties. The courses for specialization would last from two to five years depending on the specialty sought. Postgraduate courses for specialization in dentistry would last two years, at the end of which the candidate would be given the diploma of specialist with the right to practice.

At present, schools of specialization in dentistry as a part of the department of medicine exist at the following universities: Milan, Pavia, Turin, Genoa, Bologna, Florence, Rome, Naples, Bari and Padua. There are no special hospitals for the official teaching of dentistry. This is taught in all the universities at dental therapeutic clinics. The universities of Padua, Bologna, Parma, Milan and Pavia have clinics of dentistry, whereas those of Florence, Rome, Naples, Bari, Palermo and Catania have clinical courses in dental therapeutics. The other universities have dental centers for ambulatory patients.

The school for postgraduate studies in dental therapeutics and dental prosthesis of the University of Milan is the oldest good dental school in Italy. At this university, where there are 40 chairs and 40 students, the postgraduate courses last two years. The candidates take examinations at the end of every year and submit a thesis at the end of the two years to obtain the diploma of specialization. The following subjects are studied in the postgraduate courses: laboratory on conservative procedures on phantom or plastic mouth; dental surgery; prosthetic and odontotechnical laboratory; symptomatologic therapeutics of diseases of the mouth, teeth and jaws; orthodontic and periodontal laboratories; conservative treatment (clinical work); prosthetic clinics; roentgenologic laboratory; oral surgery; orthodontic clinics (practical work); plastic resins and ceramic dentistry; periodontal clinics; relations between oral and systemic diseases; dental hygiene and prophylaxis; anesthesia; dermosyphilography in relation to oral diseases; otorhinolaryngology and forensic medicine.

### In-service teacher training in dentistry

Arthur H. Wuehrmann. *J.D.Educ.* 20:83-94 March 1956

Today's dental student is expected to familiarize himself with the course content presented by each of his instructors, yet they are not always well informed about other allied teaching areas. The dental teacher must be as well informed as his students on all subjects, and considerably better informed in the area of his chief teaching responsibility. This is not true of the present staffs in most dental schools.

In-service teacher training is a substitute for or continuation of formal training in teaching professional studies. It is an effort to attempt for the dental teacher what colleges of education are doing for the educated layman who plans to enter the field of teaching. The purpose of in-service training of dental teachers is to increase the general knowledge of the dental teacher to the overall scholastic level expected of his students, and to help the dental teacher improve his ability to communicate his knowledge.

In-service teacher training programs should be conducted during the day and on institutional time. If the clinical instructor is to become a more

effective person, if he is to improve his teaching through self-education, he must be expected to teach no more than half time, and budgetary supplements must be found so that his contact teaching load can be reduced.

An educationalist or a psychologist trained in educational methodology might be included on the staff of the dental school faculty. Young basic science instructors might be encouraged to work toward a dental degree concurrently with their teaching assignments. Graduate students in education might be invited to enter dental school to observe and study in preparation for their doctor's dissertation.

Each staff member who teaches half time or in excess of half time should be required each semester to take at least one course other than that connected with his own sphere of activity. Younger instructors without major course responsibilities should be encouraged to accept minor teaching responsibilities in areas foreign to them.

An important phase of in-service training is curriculum analysis. Faculty members with major course responsibilities might be asked to participate in a program wherein they discuss the purpose of their course, content, and accomplishments.

Various clinical men could offer abbreviated postgraduate courses for their clinical colleagues. The yearly rotation of young instructors on a voluntary basis between schools within a region would be stimulating and productive. The suggestions of professional educators could be used to advantage.

### Dental faculty in Bombay University

Editorial. *J.All India D.A.* 28:68-69 March 1956

The establishment of a separate dental faculty, independent of the medical faculty, by Bombay University is a landmark in the history of dental education in this part of India. Heretofore, dentistry has been under the management and control of the medical faculty. The Board of Studies in Dentistry, the Academic Council, the Faculty of Medicine, the Syndicate and the Senate of Bombay University deserve congratulations on their decision to institute a new dental faculty. An independent dental faculty will be an effective instrument to advance dental education and dentistry.

The All India Dental Association, established in 1946, brought about improvements which led to the establishment of dental faculties not only in Bombay but in other Indian universities having affiliated dental colleges. The Government of India and the state governments cooperated with the Dental Association to achieve this end. It is hoped that other universities in India will emulate the example of Bombay University and establish separate dental faculties.

## ▼ Forensic dentistry

### The ownership of extracted teeth

(Das Eigentum an extrahierten Zähnen)

N. D. Herold. *Zahnärztl.Praxis* 7:7
April 15, 1956

The body of a living human being and all parts attached to it—among them artificial bridges and tooth fillings—are not "things" in a legal sense, and can never be claimed in a lawsuit as belonging to another person. If parts are removed from the body of a living person, these previously attached parts belong to the person from whose body they were separated (paragraph 953 of the German Civil Law).

Extracted teeth, therefore, belong to the patient. Usually, the patient disclaims ownership, and then the dentist is justified in disposing of extracted teeth as he wishes (paragraph 959 of the German Civil Law).

In several instances, however, German courts have decided that if the patient does not declare explicitly his ownership of extracted teeth, the dentist is justified in assuming that a surrender of ownership has taken place. After disposal of an extracted tooth by the dentist, the patient cannot claim his ownership.

**Orthodontics and pedodontics**

▼

Orthodontics

## The utilization of Rethmann's socket apparatus as a symmetrograph (Das Sockelgerät nach Professor Rethmann als Symmetrograph)

Rudolf Karwetzky, *Dent.Echo* 25:64-67 Dec. 1955

In the last decades, many new methods and inventions have been introduced which have revolutionized orthodontic opinions and aspects. New knowledge and experience have modified old axioms. Only by further intensive research and by readiness to accept new facts, after verification, can this comparatively new branch of dentistry, orthodontics, become a true science.

Not all new methods and procedures, however, have won a place in orthodontic theory and practice. Sooner or later, many had to be discarded to be replaced by better ideas and improved technics.

Unquestionably, the method of measuring and evaluating malocclusions already has won recognition as an indispensable basis of and as a supplement to orthodontic diagnosis and therapy.

To obtain precise results in measurement and diagnosis, the three plane device, such as the symmetrograph to which Rethmann's socket apparatus is attached, is utilized.

The models are placed in the flasks by planes according to their normal position. Three planes are used: the raphe-median plane, the occlusal plane, and the maxillary tuberosity plane. The symmetrograph permits an evaluation of the direction of the raphe and its transverse relations. Any deviation from normal in the sagittal level of the molars can be graphed and later verified.

The socket (flask) frame consists of two parts which are interlocked and held together by spring bolts.

The adjusting instrument aligns the model of the upper jaw. The model of the mandible then is adjusted according to the direction of the raphe

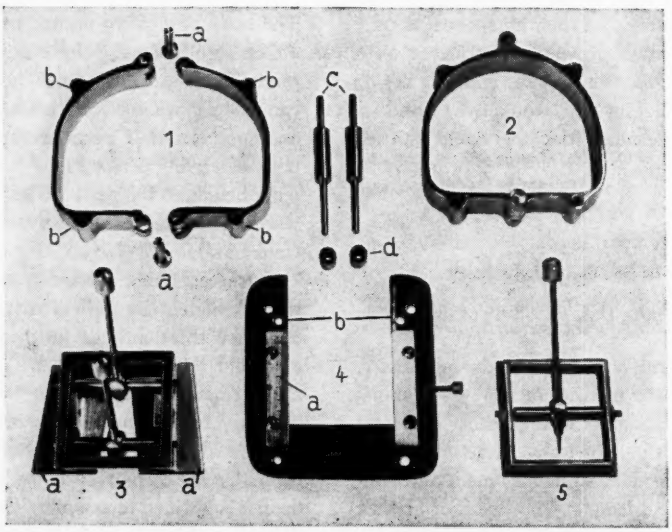


*Figure 1 Above left: Open socket (flask) frame. Above center: Two spring bolts. Above right: Closed flask frame. Below left: Adjustment (orientation) instrument. Below center: Base frame. Below right: Symmetrograph*

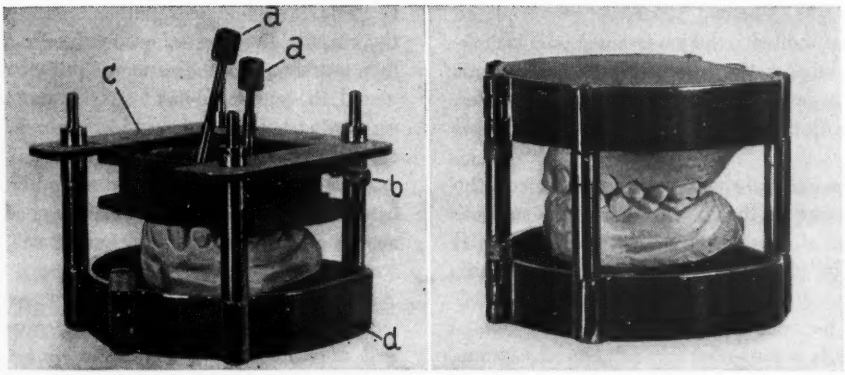


*Figure 2 Socket apparatus. Left: Model of maxilla in position. Right: Models of both jaws in position*

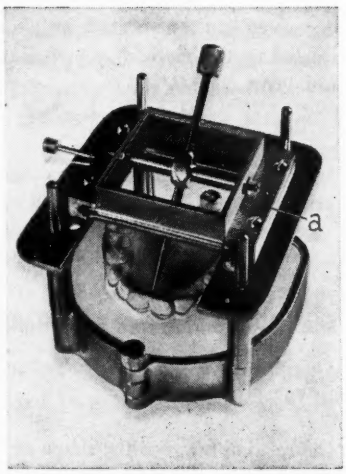


*Figure 3 Recording of the direction of the raphe*

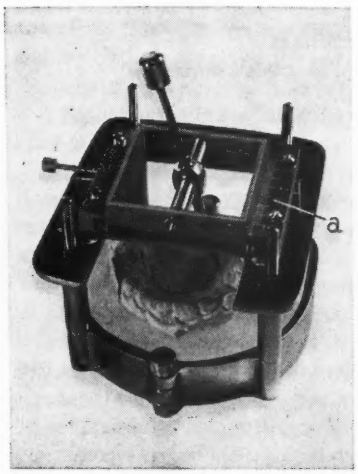


*Figure 4 Socket apparatus, symmetrograph and adjustment instrument*

by two fixed pins. The baseplate is provided with grooves and is kept in position with adhesive wax. The model can be shifted on the baseplate and aligned without difficulty in accordance with the direction of the raphe.

Several bolts are inserted with their shorter ends into the specially drilled holes in the interlocked flask frame, and washers are slipped over these bolts.

The socket apparatus then is inserted into the base frame. After the correct position is established, adjustment instrument and base frame are locked with screws. The model of the upper jaw is moistened, and the flask frame placed on a glass plate and filled with model plaster. The bottom surface of the model now lies parallel to the occlusal plane, and its lateral and posterior surfaces are in perpendicular position.

The symmetrograph records the raphe and transverse lines of the upper jaw. If, in comparing the transverse symmetry, the measuring points do not appear at the same level in a sagittal direction, the divergences can be verified with a millimeter graduation on the guide bar.

After placing the model of the mandible into the flask, the base frame and the symmetrograph

are removed. A second flask frame then is placed on top of the bolts, the lower jaw model is moistened, the socket apparatus placed on the glass plate, the lower frame filled with model plaster, and the desired contact of both models obtained and fixed.

In instances of mandibular displacement, the median line of the mandible will not coincide with that of the upper jaw. The lower jaw model should be placed on a specially designed flask, and aligned so as to coincide with the actual difference between both jaws.

All parts of the socket apparatus are chromium-plated. The recording needle and the fixing pins are made of stainless steel.

### Class I malocclusions —a preventive simplified approach

Samuel R. Siegel. *New York D.J.* 22:199-206 May 1956

The present-day treatment of crowded Class I malocclusions generally ignores the developing dentition. Early treatment has preventive aspects which circumvent the development of a severe malocclusion in the permanent dentition. If crowded Class I malocclusions are observed early in the mixed dentition stage, the dentist has an opportunity to guide and influence the eruption of the remaining unerupted permanent teeth.

The first step in this simplified, preventive approach is to take study models and roentgenograms, to determine whether the arches will be able to accommodate a full permanent dentition in good alignment, or, if not, what the degree of crowding will be. If the permanent upper and lower anterior teeth are crowded, partially or wholly unerupted or lingually erupted because of lack of space, the four deciduous cuspids are extracted. The four lower anterior teeth, as soon as they have space, frequently will align themselves because of pressure of the tongue. Should the four upper anterior teeth have to be aligned, mechanical therapy is usually simple and brief.

Progress models and roentgenograms are made. The period when the remaining permanent teeth are ready to erupt is an important stage, at which the decision to extract the four first bicuspids can be made. If the first bicuspids are erupting before the cuspids, they are allowed to erupt and are then extracted. If the order of eruption is reversed, the unerupted first bicuspids are removed surgically, before the cuspids, erupting in a crowded arch, can become malposed. The remaining permanent cuspids and second bicuspids now have an opportunity to erupt in good alignment because there is sufficient space in the arches.

After the complete eruption of the cuspids and second bicuspids, the teeth in each jaw are usually well aligned. The second stage of treatment usually consists of simple closure of spaces and correction of rotations. The appliance therapy is relatively simple and of brief duration.

Patients in economic brackets that preclude expensive and time-consuming treatment can be treated by this method at a small fraction of the usual cost.

## ▼ Growth and development

### Bite development and body build

Arne Björk. *European Orthodont.Soc.* 30:123-138, 1954

The relation between the shape of the body and that of the head and face has been a matter of interest and conjecture. B. Lindegård, assistant professor of anatomy at the University of Lund, has investigated the relation between the shape of the facial and skull structures and the body build in 20 year old Swedish men. The investigation was carried out on the adolescent study group which had served for the author's cephalometric roentgenographic studies of facial growth from the age of 12 to 20 years. The association of the development of bite structure and the body as a whole was analyzed in search of guidance in estimating the developmental tendency of the bite, and for prognosis in clinical orthodontics. The following conclusions were reached:

1. Predominance of ectomorphy in body build is associated with tooth crowding, predominance

of mesomorphy with tooth spacing. No relation was found between the shape of the dental arch and any of the three types of body build as rated by Hooton.

2. The size of teeth and size of dental arches, but not the degree of tooth space, varies with the skeletal sturdiness as well as with the length factors (skeletal constitution according to Lindegård). The association is closely related to the skeletal sturdiness.

3. Skeletal sturdiness is accompanied by a tendency to buccal occlusion, slenderness to lingual occlusion (cross-bite).

4. Skeletal sturdiness is accompanied by earlier eruption of the permanent teeth.

5. The effect of orthodontic treatment in children is significantly related to the sturdiness of skeletal development. Sturdily built children respond better to orthodontic treatment (bite raising) than do slenderly built children. This is explained by a greater growth activity in sturdily built children.

6. The variation in growth with the skeletal constitution has been histologically proved to be related to a variation in periosteal growth activity.

7. The growth activity is manifested by roentgenographic cephalometric analyses of growth in size. This method is of value in orthodontic practice to demonstrate the growth activity of the head and face as a whole or in specific regions.

## Growth at facial sutures

J. H. Scott, Belfast, Ireland. *Am.J.Orthodont.* 42:381-387 May 1956

Knowledge of the methods, sites and patterns of growth in the human face is important in the understanding of the etiology of malocclusions and facial deformities. Pritchard and others (1956) have shown that a typical facial suture is composed of the following layers of tissue between the bony margins of the suture: a cellular layer belonging to each bony unit; a fibrous layer continuous with the fibrous periosteum covering each bone, and a central layer containing blood vessels and uniting strands of collagenous fibers.

Growth at a suture takes place at each of the cellular layers and may differ in its intensity and amount for each of the bones. The relationship of the bones to one another at a suture may be an edge-to-edge relationship or an overlapping relationship.

The sutures of the craniofacial skeleton can be grouped into a number of suture systems. The sutures making up each system are so arranged as to permit growth in a certain direction. The suture systems in the human face are as follows:

1. The sagittal suture system is made up of the midpalatal, intermaxillary, internasal and metopic sutures with the mandibular symphysis. It is complete in fetal life and at birth, and permits growth in width of the facial skeleton. At the end of the first year, the mandibular symphysis and the metopic suture usually have united, and the saggital suture system is no longer complete. It is doubtful whether any further growth takes place in the midpalatal suture.

2. The maxillary suture system is made up of the sutures separating the maxilla from the nasal, frontal, lacrimal, facial ethmoid, palatine, zygomatic and vomer bones.

3. The craniofacial suture system is made up of the supramaxillary and retromaxillary facial bones on one side and the frontal, mesethmoid, sphenoid and temporal bones of the cranium on the other. Union takes place between the facial ethmoid and the perpendicular plate (a cranial bone) across the cribriform plate when the child is between three and five years of age, and it is probable that after this time growth ceases in this suture system.

The maxillary and craniofacial suture systems are so arranged as to permit downward and forward growth of the upper facial skeleton and especially of the maxilla.

Growth at a suture may or may not involve a change in position of the suture and may or may not involve separation of the bones. During early childhood the maxilla is thrust downward and forward from the anterior segment of the cranial base, but this process of bodily movement of the bone is not brought about by growth in the sutures. The separating force is provided by growth of the septal cartilage and the orbital contents.

**Armamentarium**

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Instruments

## Excision of oral tissues by suction biopsy (Die Probeexzision aus der Mundhöhle bei Saugbiopsie)

K. Heinkel and N. Henning. *München.med. Wschr.* 97:1182 Sept. 9, 1955

The ideal of histologic research is to examine the living tissues directly and to compare the results obtained with data providing a minimum deviation from the norm but with a sufficient differentiation to permit maximum recognition of the various component elements. Since this ideal has not been attained as yet, new methods are frequently introduced.

Because of the thickness of most tissues and organs, the examination directly under the microscope of live specimens is difficult.

For proper microscopic examination (magnifying up to 1,500 diameters), the tissues must be cut so thin that after appropriate staining they can be studied by transmitted light and without confusion caused by several superposed cell layers.

The examination of the interior of a hollow viscus such as the oral cavity has been done for many years with the endoscope. The disadvantages of this method are that it is difficult to regulate the deepness of the excision, and complications such as perforations occur. The utilization of another instrument, therefore, was indicated.

Suction biopsy was introduced and described by Tomenius, and favorable reports on this method were written by Wood and his collaborators.

A new instrument, to be used in suction biopsy for removal and examination, usually microscopic, of tissues from the living organism for diagnostic purposes, has been introduced by the authors. This instrument (Fig. 1) is a modified and improved type of one that has been used previously. It is easier to manipulate and regulates the deepness of the test excision. The depth of the cut is determined by the position of holes in the instrument and by checking constantly the strength of the suction pressure applied. The cuts

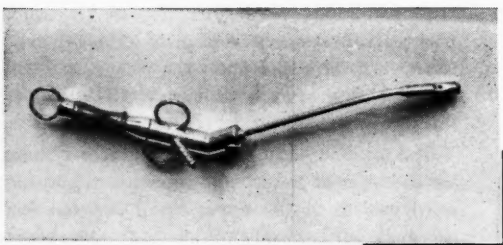

*Figure 1 Left: Instrument for suction biopsy of oral tissues*

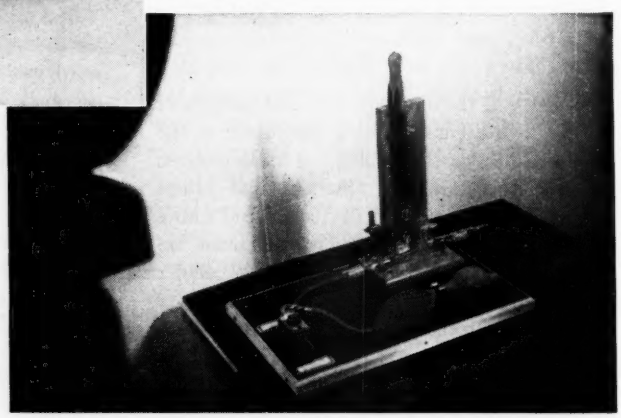

*Figure 2 Right: The complete apparatus—suction biopsy instrument and water vacuum pump*

in the tissues, made by specially honed, small knives do not cause severe bleeding. When active hyperemia is present, however, mild hemorrhages can occur.

Usually, the comparatively small excision wounds, never larger than 2 mm. in diameter, heal without complication.

The minute parts of living tissue material, collected by this suction biopsy instrument, are fixed in a solution of 10 per cent formaldehyde (Formalin), and after impregnation with alcoholate and xylene, they are imbedded in paraffin. The purpose of the fixing fluids is to penetrate and kill the tissues quickly, so that the various tissue elements are preserved in as lifelike and undegenerated a condition as possible. Before histologic examination, the sections are stained with hematoxylin and eosin; the segments of connective tissue usually are stained with thiasine and celloidin.

The new suction biopsy instrument permits several biopsies to be performed in a single process.

The suction pressure necessary can be supplied by attaching a simple rotation pump to the instrument. The same quality of suction pressure, however, can be obtained by water vacuum or air pumps. In Figure 2, a water vacuum pump is connected to the suction biopsy instrument.

Whatever type of pump is used, a mercury manometer must be attached.

## ▼ Materials

### Thiokol as a dental impression material
(Thiokol som dentalt aftryksmateriale)

K. Dreyer Jørgensen. *Tandlaegebl.* 59:889-903 Dec. 1955

Four American and seven European brands of rubber base impression materials were studied. Consistency was measured at 22° C. on material mixed according to manufacturer's directions. One half cubic centimeter of material was placed on a glass slab; 90 seconds after the start of the mix a load of 150 Gm. was placed on the specimen; the average diameter after ten minutes was recorded. The values ranged from 21 cm. to 36 cm. Variations in accelerator:liquid polymer ratio resulted in minor variations in consistency. The time from the completion of mixing until the materials lost their plasticity (working time) was determined for materials stored in 80 to 85 per cent relative humidity and 45 to 50 per cent relative humidity, for various accelerator:liquid polymer ratios.

The working time decreased after storage in air of high humidity. A high accelerator:polymer ratio had a similar effect. The setting time may be decreased by the addition of a few drops of water and may be increased by the addition of oleic acid.

Temperature rise during setting was measured in cylinders, 15 mm. in diameter, 20 mm. high. All materials except one exhibited temperature rises of less than 5.5° C. About half of the temperature rise was caused by or occurred during the spatulation.

Linear dimensional changes were studied on specimens 20 to 50 mm. in length placed on mercury with one end fixed. A small ball of tin foil was impressed in the free end of the specimen and was used as a reference point for measurements under a measuring microscope. In all instances after an initial expansion the materials contracted so that the result after 24 hours was a contraction of the order of .13 to .39 per cent of which approximately .03 per cent is considered thermal contraction.

Part of this contraction may not occur in the actual use of these materials when the materials are restricted by a tray and held under some pressure. It was found that the hardness, as measured by a 4 mm. ball, under a 500 Gm. load for 15 seconds, was highest for materials of high elasticity. Linear dimensional changes due to water sorption were found to be negligible.

The coefficients of thermal contraction were determined in a mercury dilatometer on 7 by 7 by 30 mm. specimens over a temperature interval of 15° C. The average value was found $150 \times 10^{-6}$ cm/cm/C°.

Elasticity was determined as follows: A steel ball of 4 mm. diameter was momentarily pressed 5 mm. into the plane end surface of a cylindrical

specimen at the time when the manufacturer's direction indicated that the material could be removed from the mouth. After a 15 minute interval for recovery, a stone replica was made of the indented surface, and the height of the replica of the spherical indentation was measured. Large variations were found between various materials. When the steel ball was depressed 5 mm. into the material for five seconds the permanent deformation was almost tripled, indicating that rubber base impressions should be removed by a sudden pull. Indentation later than the time recommended by the manufacturer for removal of the impression from the mouth resulted in lower values (better elastic properties). It is recommended, therefore, that these materials be kept in the mouth longer than is recommended by the manufacturers.

**Gold alloys, carat standards and specific volume** (Goldlegierungen, Karatzahl und spezifisches Gewicht

F. W. Selbach. *Bl.Zahnhk.,Zürich* 17:38-39 March 1956

The use of pure gold in dentistry is limited. Its extreme malleability and lack of response to heat treatment prevents its utilization in cast and wrought appliances.

There has been a tendency to appraise the value of dental prostheses on the basis of their gold carat contents. The dentist is not a jeweler; his work must be judged by the degree of improvement, comfort and rehabilitation it brings to the patient, and not by the value of the material used in construction of dentures.

To meet the requirements of present-day dentistry, it was necessary to develop alloys of gold, silver or platinum.

Palladium-silver alloy, light in weight and of a neutral color, now is used frequently for dentures and orthodontic appliances.

Until 1930, many dental colleges warned against the use of gold alloys below 18 carat, and many textbooks today still repeat this warning.

Copper-gold alloy now is one of the most important materials. These two metals form a continuous series of solid solution above a temperature of 400° C. To be useful for dentistry, an alloy should be heated and cooled suddenly after having reached a temperature above 450° C. If a hard alloy is desired, heat treating at slightly above 300° C. is adequate. Gold alloys containing less than from 68 to 75 per cent (about 14 carat) of gold are not indicated for use in the oral cavity.

Gold and silver also form a continuous solid solution, but their use is limited for prosthetic purposes. When platinum is one of the constituents of the alloy, the material is more effective. The prime purpose in using nickel alloy lies in its hardening property. Although it dissolves gold up to 6 per cent, its utilization as a dental alloy rarely exceeds 2 per cent.

Equal in their dental importance to copper-gold alloys are platinum-gold and palladium-gold alloys. Recent research has revealed that a substantial improvement in dental alloys is possible by adding platinum or palladium to dental gold. The addition of platinum increases the hardness of yellow gold and gives strength in excess of 150,000 pounds per square inch, increases resistance to corrosion and lightens the color. Alloys of the platinum group yield a dental material of high melting range, extreme hardness, and an elongation of at least 10 per cent.

The specific volume of a metal or alloy is equal to the number of cubic centimeters occupied by 1 Gm. of substance when the specific gravity is compared to that of water at 4° C. as a standard. A cube of gold alloy, 1 cm. on each side, weighs from 13 to 17 Gm., that of palladium-silver alloy weighs about 12 Gm., and that of a platinum-gold alloy from 17 to 19 Gm.

The specific volume makes it possible to compare alloys. For instance, a piece of 20 carat gold weighs about 56 times as much as a similiar piece of palladium-silver alloy; both are available at about the same price. Such a calculation can be important for dentists in times of gold scarcity.

The specific volume of a dental alloy also can help in the evaluation of the porosity of the cast. The nearer the specific volume after casting is to the specific volume before casting, the less porous (and therefore better) is the cast.

The porosity of casts, however, can be more easily determined by roentgen rays than by calculation of the specific volume.

### Unifolan I, a new plastic wound dressing (Dr. Kalden's Unifolan I)

Hermann Jentzsch. *Dent.Echo* 26:74 March 1956

The main use of Unifolan I, according to its inventor, a German dentist, is to serve as a universal dressing which protects injuries of dentin or pulp against damaging effects of phosphoric acid, silicic acid (silicate fillings), methacrylic acid (plastic fillings), heavy metal salts (affinity of metals to albumin) and against thermal, bacterial and electrical influences.

Secondary indications include its utilization as a siccative for mucous membranes and as a protection for hardening fillings. It safeguards extraction wounds from reinfection, protects the mucous membrane when applying linings with self-polymeric materials, impregnates cotton used during treatments, isolates iontophoretic needles and insulates acrylic and metal fillings.

Unifolan I is a plastic dressing on a polyamide base, and forms, after application, a thin, quickly drying, elastic, homogenous plastic film which adheres well wherever applied. The pH of the solution is 6, and the dry film, from 7.5 to 8 pH plus alkaline. The material has reliable lasting effects, and its application is simple. It can be applied even to the smallest cavity.

Unifolan I has a high mechanical strength which prevents the dressing from being damaged during filling procedures. It averts damage to the contours of cavity edges, and secures optimum retention of all types of fillings.

Unifolan I is a nonirritative, nonpoisonous, noncorrosive plastic dressing impermeable to bacterial invasion.

### The technic of fabricating vinyl resin models

Peter F. Fedi, Jr. and Charles F. Rau. *U.S.Armed Forces M.J.* 7:544-550 April 1956

Visual aids in the teaching of clinical recognition of periodontal diseases have been limited in the past to flat plane projections in black and white or color, with accompanying written descriptions. Study models have been made of plaster or acrylic resin, which leave much to be desired. A simple, practical method of producing soft, resilient, lifelike models of periodontal disease entities with vinyl resin has been developed.

The procedure is basically that described by Peck and associates (1953). It involves (1) taking an accurate impression of the complete arch with alginate impression material, (2) pouring a cast in high-heat investment on the impression, (3) covering the cast with baseplate wax and spruing, (4) embedding the wax-covered, sprued cast in high-heat investment, (5) boiling out the wax and drying the mold, (6) pouring a final mold of linotype metal, (7) painting the resilient vinyl resin into the metal mold, (8) processing the resultant model, and (9) modifying the model and applying the final cure. Each step is described.

The technic is within the realm of practicability for every dentist. With the exception of the vinyl resins, the materials required are ready at hand. The procedure is useful in fabricating vinyl resin models for almost any purpose, including study aids, patient education, clinical presentations, case histories and visual aids for teaching.

Lifelike conditions can be duplicated readily, using color transparencies as a guide. The procedure does require a little time, but once the metal molds have been fabricated, innumerable models can be produced.

## ▼ Therapeutics

### Treatment of postextraction pain with vitamin $B_{12}$ (Zur Therapie des Dolor post extractionem et operationem mit Vitamin $B_{12}$)

Wolfgang Bethmann. *Zahnärztl.Rundschau* Nov. 20, 1955

Sudden and severe pain after tooth extraction always is disturbing to the patient and the dentist. A mild sedative should be given for the immediate, temporary relief of the pain.

Clinically, two types of postextraction pain are distinguishable: (1) stabbing pain, localized in

or near an inflamed or infected extraction wound, and (2) radiating pain not localized in the region of the wound, in which case either neuralgia or neuritis is the probable cause.

In infections of the alveolar tissue, the treatment consists of (1) a tamponade with iodoform gauze, and (2) the surgical elimination of the injured portion of the mucous membrane.

Zimmermann, after a study of several thousand instances of postextraction pain, recommends the administration of procaine penicillin (500 units) combined with a calcium hydroxide solution.

When the postoperative pain is caused by neuralgia or neuritis, Mathis recommends the administration of 400 Gm. of vitamin $B_1$ (thiamine).

Baranzi and Kovacs recommend treatment with chlortetracycline hydrochloride for postoperative pain caused by inflammation or infection.

For pain caused by dry sockets, the subcutaneous injection of minute quantities of vitamin $B_{12}$ will bring not only relief but cure.

The improvement of neuropathy in pernicious anemia obtained with vitamin $B_{12}$ injections has influenced many dentists to utilize the vitamin $B_{12}$ therapy for the treatment of postextraction pain. The subsequent wound treatment consists of irrigations with chamomile and application of a loose tamponade.

### An evaluation of Clorpactin WCS 60 as an adjunct in periodontal therapy

Alvin M. Sackler, Samuel C. Rockoff and Herman S. Rockoff. *New York J.Den.* 26:199-201 May 1956

The efficacy of Clorpactin WCS 60 in the treatment of periodontal disturbances is evaluated. Clorpactin WCS 60 is a modified, buffered hypochlorous acid derivative in the form of a water-soluble powder whose 0.25 per cent solution with a pH of 6.8 to 6.9 is said to be germicidal, fungicidal and virucidal, yet nontoxic and nonirritating.

Thirteen patients at the Jewish Chronic Disease Hospital, Brooklyn, were taken at random, examined and instructed to place a half cup of the material provided them into an 8 ounce glass of lukewarm water and to rinse with a mouthful for 30 seconds. This was to be repeated until the glassful was used. The procedure was to take about five minutes, and to be done three times daily.

A reduction in bleeding was noted in two patients. Three patients showed a decrease in fetor at various times during the four week period. Two patients reported some alleviation of pain. No consistent, over-all pattern of improvement could be distinguished. There was no improvement in gingival tone, no reduction in calculus formation nor any improvement in gingival architecture. Use of a placebo produced no changes.

### Our experience with a water soluble compound derived from chlorophyll

(Nuestra experiencia con un derivado hidrosoluble de la clorofila)

Sabino Ochandiano Oyarzabal. *Rev.espan.estomat.* 4:105-109 March-April 1956

The etiology of the aphthae of the mouth is unknown. They are variously attributed to ultrafilterable viruses, trophic disturbances and increased catamenial estrone.

To date, to quote Thoma, there seems to be no satisfactory treatment for these aphthae. But the application of a water-soluble compound derived from chlorophyll and prepared under the name of "Rinoclorofil" by Professor Bustinza has produced encouraging results.

Rinoclorofil stimulates cell growth, acts as a deodorant, is slightly germicidal, and is well tolerated by the oral mucosa. A couple of drops are applied to the aphthae three times daily.

Over 100 patients with aphthae have been treated with Rinoclorofil. The ulcers improve considerably, pain disappears after the first applications, and only a low percentage recur.

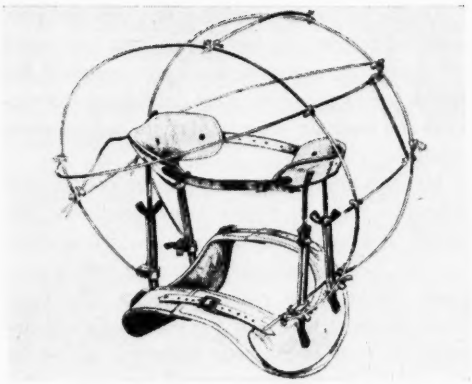

*Figure 1 The head frame assembled on a Forrester collar*

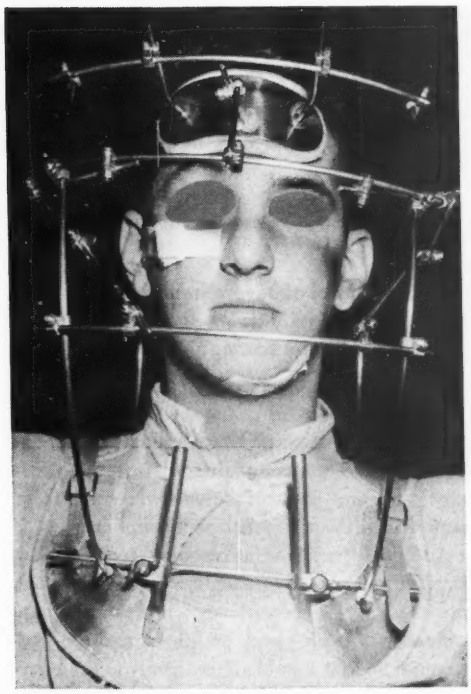

*Figure 2 The head frame assembled on a patient who had depressed fractures of both zygomas and maxilla, and a comminuted fracture of the mandible. In this instance, when the use of the chin cup was undesirable, the appliance was stabilized with a forehead pad*

**Oral surgery**

▼

Fractures

## A new head appliance for use in patients with maxillofacial injuries

William B. Irby and Gordon P. Gavin.
*J.Oral Surg.* 13:297-299 Oct. 1955

Head appliances commonly used in the past in the treatment of severe fractures of the facial bones have left much to be desired. Frequently, such appliances are unstable, do not lend themselves well to unilateral traction, are uncomfortable and impede personal hygiene. Necrosis due to pressure spots has been a problem. Many patients with maxillofacial injuries also have complicating head injuries; therefore, a new approach to this problem was needed.

A new appliance has been developed which uses a Forrester collar as a basis, to maintain the head and trunk in a correct relationship. A versatile and adjustable framework was designed and constructed of a series of spring steel wires. The framework forms a cagelike skeleton around the head. The various segments are connected by means of Roger Anderson clamps. Four large brass clamps are fitted to the four posts of the Forrester collar. The resulting framework is stable, completely adjustable and allows traction to be applied from any direction. In instances involving severe lacerations of the chin, the use of the chin cup is undesirable; the appliance may be stabilized through use of a forehead pad.

The new appliance has been found to be stable, adjustable, comfortable and better tolerated by the patient. It causes a minimum of interference with sleep. The face and head are easily kept clean. The appliance may be removed temporarily when the patient is bathing or shaving.

## ▼ Extractions

### Effective control of severe hemorrhage from the oral cavity (tooth sockets) of a probable true hemophiliac

L. A. Vander Hamm. *Texas D.J.* 74:7-9 Jan. 1956

Perhaps the most perplexing problem which confronts the oral surgeon is that of performing surgery in the oral cavity of patients who suffer from hemorrhagic disorders such as hemophilia.

An ideal pack for a bleeding tooth socket should be composed of a material which does not lose its identity or consistency when brought into contact with fresh blood, oral fluids and the oral bacterial flora; it should adhere firmly to the bony walls and the soft alveolar tissues of the socket; it should be compatible with the human oral tissues, and it should contain as many factors as possible which will aid in the coagulation of the blood at the site of hemorrhage.

A 32 year old man was admitted to the hospital emergency room because of persistent bleeding from the soft alveolar tissues adjacent to a large distoocclusal cavity in the upper right first molar. The hemorrhage, apparently caused by trauma during mastication, had occurred spontaneously two days earlier.

The Lee-White clotting time of 20 minutes 15 seconds and the short serum prothrombin time (23 seconds) indicated that the patient was a hemophiliac.

After consultation with the patient's physician, the upper right first molar and the lower left first molar were extracted. There were large cavities and pulp exposure in both teeth. The tooth sockets were packed tightly with absorbable gelatin sponge which had been saturated with 1,000 units of thrombin. The flaps were then drawn tightly over the gelatin sponge pack with silk sutures. The patient was sent to his room with no more than normal postoperative bleeding.

On the following morning, it was seen that pronounced hemorrhage had started from both sockets during the night. Hemorrhage continued for five days in spite of frequent débridement of the clots and insertion of pressure packs and systemic treatment.

Six days after the extractions, the patient was taken to surgery. Under local anesthesia the mouth and tooth sockets were débrided of clots and the sockets were tightly packed with a prepared bovine bone paste, Osteogen. The flaps were drawn tightly over the pack with silk sutures. As soon as the bone paste was placed in the sockets, the bleeding stopped completely. The postoperative course was uneventful. Six weeks later the sutures were removed, and it appeared that normal healing had occurred.

The author had previously used the prepared bovine bone paste experimentally in the office in routine extraction sockets, in impacted third molar sockets, and for bony defects after enucleation of radicular root and dentigerous cysts. A pronounced hemostatic effect is noted when the bone paste is placed in extraction wounds and brought into direct contact with bleeding bone and soft alveolar tissue. The material appears to be completely compatible with the human oral tissues.

Undoubtedly the hemostatic properties of the paste result from the fact that the bone is stored in bovine plasma which is rich in all coagulating blood fractions.

### ACTH treatment before tooth extraction for a patient afflicted with thrombopathy

(Die Vorbereitung eines thrombopathischen Kranken mit ACTH zur Zahnextraktion)

Karl Balogh and K. Lelkes, Budapest, Hungary. *Schweiz.Mschr.Zahnhk.* 65:1243-1250 Dec. 1955

Thrombopathy is characterized by a deficiency of the thrombus-formation and a disturbance of the platelet-forming function.

Patients afflicted with this or other hemorrhagic diseases are endangered by every injury or surgical intervention because their increased inclination to bleed often produces prolonged and almost uncontrollable hemorrhages.

In all instances of dental and oral surgery, adequate preparations should create optimal conditions. Before preparation of the patient, an intensive laboratory examination should be made to establish the differential diagnosis.

The patient, a 29 year old man, came to the Dental Clinic of the University of Budapest to have a carious molar extracted. His past history revealed that he was afflicted with thrombopathy. Previous extractions had been followed by hemorrhages that lasted for from 25 to 30 days. After every surgical intervention, hospitalization had been necessary. Blood transfusion and application of local hemostatics (at the hospital) had finally checked the flow of blood.

Blood serum tests revealed that, although the clotting and prothrombin time seemed almost normal, the clot retraction had been slow. The appearance of the Rumpel-Leede phenomenon indicated a hemorrhagic diathesis. The number of thrombocytes was not abnormal, but a turbid agglutination occurred. The shape and size of the thrombocytes differed from normal, verifying the diagnosis of thrombopathy.

Most types of thrombopathy are caused by hereditary factors. The mother and sister of the patient and the daughter of his brother were examined; all showed hemorrhagic diseases of a lesser degree. In the case reported, bacterial and allergenic effects of existing pathologic processes also played an important part in the manifestation of hemophilia.

In the preparation of the patient for tooth extraction, the hemostatic effect of ACTH and its influence on blood clotting were utilized. During the blood serum tests, 200 mg. of ACTH were administered. Afterward, the patient received 75 mg. doses on the first day, 45 mg. on the second day and for the subsequent four days a 20 mg. dose daily.

As a reaction to ACTH, a distinct change in the number and function of the thrombocytes was observed. After the fourth day, the patient had reached the optimal state of blood coagulation, and it was possible to extract the molar without danger. The extraction was performed under regional anesthesia and without unnecessary trauma or laceration. Penicillin was administered for two postoperative days. On the third day, the patient was dismissed because no postoperative hemorrhage occurred. The healing process was normal.

Examination, 18 days after extraction, revealed that the patient's condition did not differ from that of a person after an uncomplicated extraction.

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## Surgical pathology

### Post-operative bleeding following on the extraction of teeth from a patient suffering from "Christmas" disease

P. C. Snyman. *J.D.A.South Africa* 11:130-135 April 1956

A 37 year old, well nourished, non-European man was admitted to the Pretoria General Hospital suffering from painful swollen joints at the knee, elbow and ankle. Examination of the oral cavity revealed 12 decayed molar teeth. It was assumed that the arthritis might be caused by oral sepsis, and the 12 molar teeth were removed under local anesthesia.

Two hours after the teeth were extracted, there was no sign of clot formation. Impressions were taken of upper and lower jaws, and acrylic splints were made and inserted over the bleeding sockets. At the end of three weeks the bleeding was still not under control, although the patient had received 13 pints of fresh whole blood and a variety of local treatments, including packing with oxidized cellulose soaked in thrombin, application of a paste made of zinc oxide, tannic acid and chlorobutanol, injections of irradiated antihemophilic plasma, and applications of viper vemon.

Pavlovsky and others (1947) recommended the use of human placental preparations in the treatment of hemophiliac patients. A fresh human placenta was minced, spread on plates and dried in a vacuum for 24 hours at 50°C. The desiccated placenta was pulverized and the dry powder packed into the bleeding sockets. Immediate coagulation resulted and the hemorrhage was at last under permanent control. Subsequently, a number of normal extraction wounds were treated

with placental powder; invariably, clot formation was established immediately.

A 37 year old man was found to be suffering from "Christmas disease" (Biggers and others, 1952), also known as "hemophilia B" or "plasma-thromboplastin component lack." His many women relatives are healthy with no hemorrhagic tendencies, but excessive bleeding from trivial wounds is a characteristic feature in the males; in two boys, seven and ten years old, the shedding of deciduous teeth was followed by profuse bleeding for two weeks.

**Cleidocranial dysostosis: a case report**

J. F. Van Zyl. *J.D.A.South Africa* 11:1-4 Jan. 1956

Cleidocranial dysostosis is a condition in which the patients have defective clavicles and skull deformities, with or without other multiple abnormalities of the dental and osseous tissues. People with this syndrome are usually short in stature. Mentally they are normal or above the average. The maxilla is usually micrognathous, thus giving the relatively undersized mandible a prognathous appearance. The palate is frequently narrow, high and arched with a median furrow. The syndrome is also characterized by an extreme form of delayed eruption of both deciduous and permanent teeth and a very slow exfoliation of the deciduous teeth. Many of the permanent teeth are impeded in their eruption, but nevertheless are completely formed. Such teeth often have abnormalities; some of the crowns may be conical in shape with defects on the surfaces of the enamel, and roots that are dilacerated. The deciduous teeth are usually in normal position and free from defects such as hypoplasia and malformation.

Nothing definite is known about the etiology, but heredity is considered to play an important role.

The patient, a 34 year old non-European man, was referred to the University of the Witwatersrand Oral and Dental Hospital with the complaint of pain in the left maxilla. He knew of no irregularity of his deciduous dentition, which had exfoliated when he was about ten years old. His permanent teeth, however, had never erupted, and he had been wearing artificial dentures for some time. He stopped wearing them when the pain developed in his left maxillary region.

The soft tissues of the oral mucous membrane, tongue and pharynx were normal. The palate was high and arched. The maxillary ridges appeared large and bulbous and the alveolar ridge of the mandible was thickened, especially in the symphysial region. The tips of the crowns of four lower teeth were just projecting through the mucous membrane.

Roentgenographic examination showed numerous unerupted teeth in both maxilla and mandible. The teeth were arranged in "clusters," in the maxilla on either side of the midline and in the mandible in the symphysial region. Along the inferior border of the left side of the body of the mandible a cystic cavity contained the crown of a tooth which was lying horizontally.

Because of the large number of teeth present, the operation was performed in two stages. The first stage consisted of an extraoral approach in which an incision was made along the inferior border of the mandible over the symphysial region. The skin and subcutaneous tissues were reflected upward and the buccal plate over the anterior group of teeth was exposed and removed. The unerupted teeth were found lying embedded in the bone, encapsulated in a dense layer of fibrous connective tissue. The teeth and surrounding connective tissue were removed, as was the tooth in the dentigerous cyst cavity in the left side of the body of the mandible. Seventeen teeth were removed from the mandible.

Three weeks later the teeth in the maxilla were removed. An intraoral mucoperiosteal flap was reflected extending from tuberosity to tuberosity. Nineteen unerupted teeth were lying in two "crypts" on either side of the midline, and were removed.

The teeth were all completely formed, but showed a variety of morphologic features. Some crowns resembled those of a normal series whereas others were atypical; a number appeared to be geminated. The roots were all short and stubby and many showed dilaceration. The enamel surfaces of many teeth had defects such as hypoplasia and gross indentations.

The postoperative period was without complication.

**Posttraumatic myositis ossificans of the left masseter muscle: report of case**
(Ein Fall von posttraumatischer Myositis ossificans des linken Masseter)

S. M. Davidoff, Sofia, Bulgaria. *Deut.stomat.* 5:554-558 Oct. 1955

Myositis ossificans occurs in two different forms, either as progressive multiple ossifying myositis or as a localized (circumscribed) variety. These two forms are related systemically but do not arise from the same cause.

Progressive multiple ossifying myositis is comparatively rare. It is characterized by a progressive calcification of muscles, tendons, ligaments, fascias and aponeuroses, and occurs in growing children.

The localized form usually results from repeated trauma to tendons or muscles and often follows various accidental injuries. In the early stage, fibrocartilaginous alterations occur and are followed by the development of hyaline cartilage and of osseous substances. Later lamellae appear in the involved bone, irregularly arranged with little or no remaining cartilage. This process resembles an endochondral bone formation.

The patient, a 53 year old Bulgarian farmer, had suffered about two years previously a deep wound in the region between the upper and lower borders on the left side of the zygomatic arch. The injury was caused by a thrust of a bull's horn. Despite immediate treatment with aluminum hydroxide, several additional muscles were affected. Painful swellings and edemas of the overlying skin occurred in and around the oral cavity, and evanescent fever set in. Constant trismus made it almost impossible for the patient to open his mouth.

After a seemingly uneventful treatment period, the wound healed under a normal scar formation. The patient's mouth, however, could be opened only a small distance. Every attempt by the patient to open his mouth wider was accompanied by unusual creaking and crackling sounds.

Clinically, a slight asymmetry of the face was observed, caused by the swelling in the left cheek. Palpation revealed a firm formation behind the left angle of the jaw which reached the anterior portion of the upper jaw. One of the layers of the masseter muscle was ossified; all others were normal.

Intraoral examination revealed the presence of the root remains of upper and lower incisors. The patient's jaws were almost edentulous, only two right upper molars and one left lower molar remaining. The opening of the mouth, although difficult, was not impossible.

Roentgenograms revealed the presence of a firm, bonelike neoplasm, about 2 cm. wide, starting in the masseter muscle and reaching below and behind the mandibular joint to the anterior region of the upper jaw.

The therapy (in four stages) consisted of extraction of all remaining root stumps; surgical incision (10 cm. wide and 12 cm. long); elimination of the neoplasm and involved soft tissues, and short-wave diathermy. The healing and postoperative period were uneventful.

Pure myositis ossificans sometimes occurs and is not of inflammatory origin. Occasionally, the neoplasm is composed almost entirely of osteoid tissue. Traumatic myositis frequently occurs at the site of fractures, wounds and other injuries, and infrequently in the margins of the alveolar process after tooth extractions.

## ▼ Roentgenology

**The basis for radiation protection**

L. S. Taylor. *J.Washington Acad.Sc.* 46:69-77 March 1956

In establishing a standard for radiation protection, the scientist must take into consideration whether the source is outside or within the human body. The permissible wholebody exposure to gamma rays and moderate and medium energy roentgen rays was set at 0.3 roentgen per week by the National Committee on Radiation Protection in 1946. Since there is evidence of irreversible genetic damage from exposure of the gonads to any amount of radiation, exposure of children and pregnant women should be held to a

minimum, whereas the permissible exposure of adults over 45 years of age may be as high as 0.6 roentgens per week.

To arrive at permissible exposure levels for radioactive elements taken into the body, the following factors must be considered: the fraction of material going from the blood to critical body tissues; the radiosensitivity of the tissue; the size of the critical organ in which the radioactive material may become concentrated; the essentiality of the critical organ to the proper function of the body; biological half-life and physical half-life; the energy of the radiation produced by the isotope and the attenuation of that energy in tissue.

The National Committee on Radiation Protection has worked out the maximum permissible concentration in air and in water for 100 radioactive isotopes. Additional information may be obtained from the following publications: *X-ray Protection,* National Bureau of Standards Handbook 20; *Maximum Permissible Amounts of Radio-isotopes in the Human Body and Maximum Permissible Concentrations in Air and Water,* National Bureau of Standards Handbook 52, and *Regulation of Radiation Exposure by Legislative Means,* National Bureau of Standards Handbook 61. This material is published by the U.S. Government Printing Office in Washington, D.C.

### Locating impacted cuspids: using the shift technique

George E. Ewan. *Am.J.Orthodont.* 41:926-929 Dec. 1955

Locating impacted teeth and imbedded foreign bodies is a problem which arises in virtually every dental office. To determine the exact location of the misplaced unit, dental x-ray film must be used freely. The shift technic for locating impacted teeth utilizes standard intraoral film. The shift technic results in a series of intraoral roentgenograms which permit interpretation of the third dimension.

The position of the x-ray tube is changed in making roentgenograms of the impacted tooth, so that the same structures are viewed from three diverse positions, the mesial, the standard and the distal position. The films are labeled and kept separate during developing, and are then mounted. The impacted tooth or foreign body will have a distinct relationship with its adjacent structures in each of the three views. The object which appears to have moved in the same direction that the x-ray tube was moved is the deeper object or is lingual to the adjacent structures.

Disadvantages of the shift technic are as follows: Three different films of the same region must be made and labeled; films must be mounted and labeled to show the position of the x-ray tube at the time each view was made, and films must be viewed from the labial side.

Advantages of the technic are as follows: Films that are available and fresh are used; the technic is the same as that used in virtually every dental office; the method positively locates an impacted tooth or an embedded foreign body; the technic provides a true perspective of the impacted tooth and its related structures.

### High-resolution microradiography

W. A. Ladd, W. M. Hess and M. W. Ladd. *Science* 123:370-371 March 2, 1956

A high-resolution x-ray microscope has long been sought. Recent work by others has given a method for producing good x-ray micrographs with a useful magnification of about 1,000 to 1,500 diameters but with resolution far below that of the electron microscope.

A method has been developed for coupling the high penetrating power of roentgen rays with the high resolving power of the electron microscope. The technic combines the best features of both roentgen rays and the electric microscope, and for the first time gives x-ray micrographs at useful magnifications of 10,000 to 25,000 diameters, showing detail of the order of that hitherto seen only with the electron microscope.

The basic technic consists of three steps: (1) making a relief image of the specimen in a grainless medium by means of the high penetrating power of roentgen rays; (2) obtaining a thin replica of this relief, which is then shadow-cast and made suitable for examination with an elec-

tron microscope, and (3) examining this replica under the high resolving power of the electron microscope.

A search was initiated among known photosensitive and roentgen-ray-sensitive substances for one that would show no structure in the electron microscope range. Among the suitable materials found were faces of crystals of ammonium dichromate, and the commercial polyvinyl chloride-acetate film.

The specimen is mounted tightly against the sensitive surface, and the combination is then mounted in the path of a carefully limited beam of soft roentgen rays for a sufficient period to form the image. The roentgen ray exposure changes the solubility of the plane surface. The image is developed in relief by dissolving away the more soluble portions of the exposed surface. A mixture of anhydrous alcohols is satisfactory for developing the roentgen ray image on the dichromate crystal face. With polyvinyl films a 30 per cent solution of acetone in water is used.

A cast thin enough to permit the passage of the electron beam is made of the relief surface. The replica is mounted on the customary screen. The relief of the replica is emphasized by volatilizing a thin metal coating on it from an angle. The shadow-cast replica is then ready for examination in the electron microscope.

## ▼ Surgical technic

### Plastic surgery after cleft lip operation
(Korrekturplastik nach Lippenspaltenoperation)

A. Ragnell, Stockholm. *Fortschr.Kief.Ges.Chir.* 1:84-93, 1955

Persons with cleft lip and cleft palate are treated by physicians, psychologists, phoniatricians, orthodontists and medical, oral and plastic surgeons. The problem has been considered separately by the medical and dental branches, however, thus producing confusion as to which profession should assume responsibility for diagnosis and therapy. In the last few years, the medical and dental branches have become aware of the necessity of combining their efforts.

Even after a successful operation for cleft lip and palate, plastic surgery will be necessary to correct remaining lip and nose defects, and this must be followed by orthodontic and phoniatric therapy.

For psychical reasons the corrective plastic surgery to improve the facial appearance of the patient should be performed during the following three age stages: (1) at the age of six, before the child attends school (to avoid the taunts and sneers of his schoolmates); (2) before puberty, when the patient's concern for his esthetic appearance increases, and (3) during the age span between 16 and 20, when the development of the facial bones is completed.

The routine plastic surgery procedure after a previous cleft lip operation consists of excising the remaining scars, suturing both sides of the lips in accordance with their anatomic structure, thereby obtaining a perfect junction of all involved parts of the facial musculature.

A lip that is too short is lengthened by oval incisions. In severe instances this is done in either a triangular (Barret-Brown) or a rectangular (Le Mesurier) form.

A lower lip which is either too large or too thick can be reduced through an arched dermal excision of one third of the lip and raising of the mucous membrane by suturing the skin edges.

Lips which are either too short or distorted by scar formation influence unfavorably the function of both the jaws and the sphincter. Therefore, it is advisable to correct and change the lower lip surgically during the patient's early childhood (from 4 to 6 years), so as to permit an uninterrupted development of the maxilla.

Often a retracted upper jaw is accompanied by a prognathous lower jaw and early plastic surgery can reduce the resulting malocclusion. Similar anomalies occur frequently in instances of cleft palate. The resulting asymmetry not only causes facial misproportion but also malocclusion and speech defects. After both cleft palate operation and plastic surgery, further correction belongs in the orthodontic field.

The necessary positional change of the mandible to obtain a better occlusion and an esthetic-

ally improved appearance is achieved by transversal and oblique osteotomy in the region of the ascending ramus. The progressive correction of the upper jaw can be obtained by Gillies-Kilner's inlay method in which a prosthesis is inserted intraorally in a skin-covered pocket underneath the soft tissues. A similar effect can be achieved by a transplantation of osseous material in the region of the nose and the midsection of the upper jaw.

### A study of ectopic mixed salivary tumors

Kenneth Harrison. *Ann.Roy.Coll.Surgeons, England* 18:99-112 Feb. 1956

Tumors classed in the mixed salivary adenoma group, when situated in an ectopic site, give a more serious prognosis than those arising in the large salivary gland sites. This clinical observation is reinforced by the occurrence of an occasional genuine remote metastasis, in instances where the primary tumor had been classed among the mixed adenomas.

It has always been difficult to study a comprehensive series, as the tumors are handled by so many different specialists, including general surgeons, roentgenotherapists, laryngologists and dental surgeons, but in this study it has been possible to collect a larger comprehensive series (82 cases) than has previously been reported in the literature. They were classified into the following types: (1) mixed adenomas, 29 cases, (2) cylindromas, 46 cases and, (3) adenomas, 7 cases.

There were as many as 70 tumors within the buccal cavity in the 82 cases, and well over half of them were situated on the hard and soft palate. Almost all the mixed adenomas—27 of the 29 cases—occurred within the buccal cavity. The other two tumors were situated on the nasal septum.

All the tumors occurring within the tongue were of the cylindroma pattern and were more common at the base. The neoplasms arising within the sinuses and postnasal space were cylindromas, too. The small group of adenomas all occurred within the buccal cavity.

In the mixed adenoma group of tumors, surgery or surgery in combination with irradiation was the method of choice. In the cylindroma group, about half the cases (24) were treated by irradiation only, mostly by radium, some by deep roentgen ray therapy and, occasionally, by a combination of both. Some of the cylindromas were thought to be surgically accessible, and 12 were either enucleated or excised, sometimes with the use of surgical diathermy. The remaining patients were treated by a combination of surgery and irradiation.

Block neck dissection for cervical metastases was performed on seven patients, and on histological examination, the glands were found to be invaded in six.

The results of treatment of the mixed adenoma group are good and recurrence has not been troublesome. In the cylindroma group results are uniformly bad whatever methods of treatment are used. Of the 46 cases there was local recurrence after treatment of the primary tumor in no less than two thirds (31).

Reviewing the results of therapy in the cylindroma tumors and realizing the high rate of recurrence, it is obvious that the initial treatment must be a wide radical removal of the primary tumor when it is surgically accessible.

Tumors arising on the hard palate require, as a primary measure, wide excision with the overlying palatal bone and including a large region of apparently normal tissue around the tumor. This will help ensure complete removal; at the end of the operation a dental obturator is applied, so that the patient can eat and talk fairly satisfactorily with a limited disability. Obturators can also be adapted to fill in operative defects of the soft palate and to help restore the functions of articulation and swallowing. Eventually, permanent prostheses are fitted.

When the antrum and ethmoid sinuses are involved, an excision of the maxilla, along with the orbital contents, may be the one chance to eradicate the tumor.

**Prosthetic dentistry**

▼

Complete dentures

## The attachment of extracted anterior teeth to artificial dentures

J. H. Farrell. *D.Practitioner* 6:120-121 Dec. 1955

The technic of attaching extracted natural teeth to artificial dentures is not one that can be used often, because of the lack of suitable teeth. When it can be carried out, however, the result is likely to give great satisfaction.

With the introduction of acrylic resin, the attachment of natural teeth to dentures presents no difficulty. The times and temperatures used in the curing of acrylic resin are such that natural teeth do not change in their color or strength.

The first requirement is that the extracted tooth or teeth should be of good appearance. This is usually true of teeth lost because of periodontal disease or trauma; it is in these circumstances that the main application of the technic is to be found. It is seldom desirable to use extracted posterior teeth, as their size and occlusal form make them unsuitable for use on artificial dentures.

The tooth should be prepared as soon after its extraction as possible. The root of the tooth is cut off by bur or fret saw, and the pulp removed. The pulp chamber is enlarged with a round bur and a retentive form is cut. Three retentive forms that have proved satisfactory are illustrated.

When the tooth has been cleaned, it is ready to be set up. The subsequent procedures are exactly the same as those for ordinary dentures except that the vulcanizer cure for acrylic resin should not be used. Any method of polymerization in which the temperature does not exceed 100° C. will be found to be satisfactory.

*Three methods of preparing extracted natural teeth for attachment to artificial dentures.*

**Methods of Trauner and Obwegeser for improving the retention of a lower denture by plastic reconstruction of the soft tissue** (Metoder enligt Trauner och Obwegeser för att genom mjukvävnadsplastiker förbättra helprotesens retentionsförhållanden tilllämpade på egna fall)

T. Oberg. *Svensk.tandläk.Tskr.* 48:463-473 Dec. 1955

Most surgical procedures for improvement of the retention of lower dentures have been directed toward a reconstruction of the vestibular region in attempts to increase the supporting area. When extensive resorption of the alveolar process has taken place, the action of the mylohyoid muscle may prevent good retention of a denture. Five years ago Trauner suggested a surgical procedure by which the mylohyoid muscle is detached from its origin along the mylohyoid ridge of the mandible and the floor of the mouth is lowered bilaterally. This procedure eliminates the displacing effect of the mylohyoid muscle.

After premedication with sedatives, bilateral mandibular block anesthesia and local anesthesia are administered; incision is made through the mucosa along the lingual border of the mandible from the third molar to the cuspid region. The mucosa and the submucosal tissues are retracted in a lingual direction, after which a blunt instrument is introduced under the mylohyoid muscle which is then lifted and cut close to the mandible by a pair of bent scissors without damage to the periosteum. Occasionally it may be necessary to ligate one or two minor blood vessels.

According to the original method, the edges of the mucosa and of the muscle are sutured through the skin under the cheek, and the sutures are attached to buttons or cotton rolls. Care is taken to avoid damage to the lingual nerve and the submaxillary duct. In later modifications only the mucosa (not the muscle) is sutured down.

Obwegeser has so modified the method that he mobilizes part of the mucosal covering of the floor of the mouth and uses it to repair the periosteum-covered defects on the lingual surface of the mandible. Trauner leaves these defects to be covered by secondary granulation and epithelial growth. Granulation takes about two weeks, and in two months the formation of new mucosa is completed. Antibiotics are used to prevent infection. No adverse effects have been noticed on speech, mobility of the tongue or on salivary gland functions.

Obwegeser has devised a method of increasing the supporting surface for the denture vestibular to the alveolar process by drawing laterally the layer of muscle and submucosa between the mucous membrane and the periosteum. He works beneath the mucosa through a small transverse incision which is sutured at the end of the operation. The mucosa is held against the periosteum during healing, by ligatures running through the skin or fixed around the body of the mandible.

**Indication and contraindication for immediate dentures from a social and economic standpoint** (La protesi immediate nel campo sociale ed economico sue indicazioni e controindicazioni)

Pierantonio Wiel. *Riv.ital.stomat.* 10:1505-1514 Dec. 1955

Profound alterations occur in the oral tissues after tooth extraction. Usually it takes from two to four weeks for gingival tissues to heal sufficiently to permit the insertion of artificial dentures. One of the main changes occurring in the alveolar process after tooth extraction is the marginal resorption of the sockets.

Today, few patients want to remain edentulous longer than is absolutely necessary. Therefore, immediate replacement of the extracted teeth by insertion of immediate dentures often is indicated.

Immediate dentures can be designed and constructed before removal of the teeth, and can be inserted immediately after tooth extraction. Frequently, this can be accomplished at a single appointment. It is difficult to understand why European health and hospital insurance programs do not cover the expenses for this essential dental service.

Immediate insertion of artificial dentures restores the patient's masticatory and phonetic function, permits a quicker cicatrization and a better alveolar healing and simultaneously re-

stores the esthetic appearance of his facial features. The treatment is comparatively short and the patient's activities are not interrupted.

Contraindication for immediate denture service depends mainly on individual and local complications.

The success of this type of prosthetic service depends on proper execution of all technical steps involved in denture design and construction. Since the degree of tissue resorption is not predictable with certainty, the procedures are different in each instance, and success depends mainly on the dentist's ability to evaluate the condition, and to determine which type of denture is indicated.

In instances in which several teeth have to be replaced at the same time, the alternative (and often preferable) method consists of constructing a preliminary immediate removable denture which can be worn until all ridges heal. The appliance later will be replaced by a permanent denture.

The utilization of immediate dentures, however, should be considered as a sanitary and hygienic dental service for the general health and the psychologic well-being of the patients, and should have its deserved place in the program of all health and hospital insurance companies.

## ▼ Partial dentures

### Nylon denture base

G. E. M. Hallett and J. H. Farrell. *D.Practitioner* 6:239 March 1956

Because of the present interest in nylon as a denture base, the experience of the senior author, who has worn two partial upper dentures constructed of nylon, is reported. The artificial teeth in each denture were acrylic resin, their retention being mechanical. Both dentures were processed by a specialist laboratory.

The first denture fitted extremely well and felt comfortable. After it had been in the mouth a few hours, however, it began to swell and was (with some difficulty) removed. During the next few days a series of adjustments were made to remove material from the clasps. The denture was then worn comfortably for the next month, at which time it was noted that the polished surface was becoming dull and rough to the tongue. The denture was repolished, but it did not keep a smooth surface for more than two weeks at a time. In order to make the surface tolerable to the tongue, frequent repolishings were necessary, which resulted in inconvenience and loss of material. At the end of two months' wear, the isolated lateral incisor had been driven noticeably into the tissues, and dark lines caused by seepage were visible between the nylon and some of the acrylic teeth.

When this denture had been worn four months it was replaced. Whereas the first denture had nylon clasps and no occlusal rests, the second denture had occlusal rests which prevented further resorption under the saddles. Roughness was just as evident as with the first denture. After eight months' wear, one of the anterior teeth loosened and came off.

Both dentures were, for a limited time, extremely comfortable—more so than any of a number of previous dentures worn over a period of 15 years and made of more rigid materials.

Unusual flexibility in a denture base may be worth striving for, even if, as seems to be indicated, nylon is a failure because of the difficulties reported.

### Screw clasps and springs: their utilization for partial dentures and removable bridges

(Verschraubte Klammern und Federn: ihre Anwendung für partielle Prothesen und abnehmbare Brücken)

Hans Scherrer. *Schweiz.Mschr.Zahnhk.* 65:862-865 Sept. 1955

The many disadvantages of dentures with customary clasps are known to all practicing dentists. When, in a free-end saddle denture, several clasps are necessary, the denture becomes too heavy and loosens the teeth to which the clasps are fastened. Occasionally, the clasp type of removable partial denture causes discomfort to the

patient because of the encroachment of the clasps on the sensitive cementoenamel junction. Frequently, clasps promote decalcification of the enamel. The construction of veneer crowns for such teeth is too expensive to be afforded by many patients.

Recently, a new method, using screw clasps and screw springs, has been introduced to replace both the afore-mentioned technics, especially for partial dentures and removable bridges. When screws 1 mm. in diameter are attached, the clasps are converted into removable spring arms which, by turning, reactivate the adhesive force of the loosened clasp arms. Removable external screws are soldered to the springs or clasp arms and attached to the denture where they are tightened with internal screws.

In patterns involving two or more surfaces, favorable results will be obtained by using the double screw-spring attachment, thereby exerting an equal traction and permitting insertion and removal of the denture without pressure.

The utilization of this new technic achieves a closer relation between biologic requirements and prosthetic dentistry.

### The use of partial dentures in the restoration of occlusal standards

John H. Wilson. *Austral. D.J.* 1:93-101 April 1956

Partial dentures add most to the restoration of occlusal standards in association with other methods aimed at improving the habitual occlusion. The value of partial dentures in this respect is relative to the degree of malocclusion and to the extent to which occlusal standards can be restored. When used without correction of an habitual occlusion, the partial denture becomes a part of the malocclusion, as does most restorative dentistry. Even here, however, a partial denture is a valuable form of restoration in that, if scientifically used, it helps prevent further deterioration of the natural occlusion.

Partial denture restoration presumes an understanding of anatomic and functional occlusion. Functional occlusion should represent an "achievable optimum" (Fisher) for the various jaw and tooth relationships. It is possible to establish an occlusion which has an "individual" normality characterized by tissue health.

Significant points in a functional analysis of the occlusion include the following: (1) determination of the path of closure of the mandible from a rest position to habitual occlusion; (2) the interocclusal space; (3) the temporomandibular joint; (4) muscle coordination, and (5) the hinge action of the mandible and the use of an articulator allowing an anatomic mounting of study casts.

No improvement in the habitual occlusal pattern can be expected without a functional analysis. There are two divisions of occlusion in partial denture restoration: (1) where the interocclusal space is not altered and (2) where the interocclusal space is decreased.

Where the interocclusal space is unaltered, the most satisfactory occlusion in partial denture restoration is achieved using the following treatment: (1) correction of occlusal dysfunction by selective grinding of the natural teeth; (2) extractions, occlusal grinding and orthodontic treatment, and (3) extractions, occlusal grinding, orthodontic treatment and multiple restorations of the teeth anatomy and function.

A decrease of the interocclusal space involves important functional changes, orally and extraorally.

The restoration of occlusal standards of operative dentistry is the ideal preparatory treatment for a partial denture.

## ▼ Miscellaneous

### Spring articulators (Feder-Artikulatoren)

D. D. Balters and Walter Möhn. *Dent.Echo* 26:68, 76 Feb. 1956

Spring articulators now can be considered as being the "classical" attachments in the design and construction of artificial dentures. These articulators are simple to construct and to adjust and are as useful as they are inexpensive. Their vertical

elastic supports consist of strong perpendicular springs which permit without difficulty or disturbance a lateral sliding movement of the mandible during speech or masticatory function.

Neither plaster nor wear and tear will damage these attachments. After the plaster has become dry and hard, a slight movement of the springs makes the plaster pieces break off.

To obtain greater strength and stability, especially in the construction of complete dentures, it is advisable to add supporting rods to these attachments. These rods should be placed in the spirals. A perfect articulation is obtained which cannot be disturbed even by the greatest stress. The springs and rods should be oiled from time to time.

The spring articulators designed for complete dentures have a rod to which a screw is attached keeping the upper denture in position. With such rods, the height of the bite is regulated easily and can be retained.

Three different types of spring articulators are available: (1) for complete dentures; (2) for partial dentures, and (3) for crowns and bridges. All types are made of rustproof brass, nickel-plated or chromium-plated. The upper arch of these instruments is removable (and therefore replaceable) to permit undisturbed work on the models.

These spring articulators, already tested in German dental practice, will soon be indispensable for dentists of all other countries.

**The importance of a mucin solvent and wetting agent in impression taking with alginate materials** (Betydelsen av ett mucinlosande och ytspanningsnedsattande medel vid avtryckstagning med alginat pa helt eller partiellt tandforsedda fall)

B. Hedegard and G. Nyquist. *Svensk tandlak. Tskr.* 48:455-462 Dec. 1955

It has been suggested that better detail in dental impressions might be obtained by the use of salivary inhibitors or small amounts of astringents. Ericsson and Stjernström showed that a mixture of ascorbic acid, copper sulfate and hydrogen peroxide is a potent solvent for mucin.

Models obtained from alginate impressions taken after spraying with a similar mixture were compared with models obtained from alginate impressions taken after spraying with water.

Fifteen students and staff members of the prosthetic department of the Royal Swedish Dental School at Stockholm volunteered to have several alginate impressions taken for this study.

Maxillary and mandibular study models were first made and individual perforated trays were made of Ackermann's shellac plates, allowing approximately 2 mm. space between tray and study model. Final impressions were taken in these trays after the patient's mouth had been sprayed and rinsed for five minutes. The spraying was done in a separate room by the same nurse, and the two dentists who took the impressions were not informed as to which medium was used for the spraying.

Two sets of maxillary and mandibular impressions were made after spraying with water, and two sets after spraying with an aqueous solution of: 0.02 M ascorbic acid (about 0.35 per cent); 0.25 per cent sodium bicarbonate; 0.00075 per cent copper sulfate and peppermint water.

One alginate impression material was used for all of the 120 impressions and stone models were poured immediately after the impressions were removed and rinsed in water. The proportioning and mixing of the stone (Duroc) was standardized; an electromagnetic vibrator was used to flow the stone into the impressions.

The coded models were evaluated independently by four teachers in the dental school for accuracy of reproduction of the mucosal surfaces, the gingival margin, interproximal spaces and contours of teeth and fillings. There was significantly better reproduction of surface details in models produced from impressions obtained after the mucin solvent and wetting agent had been employed than when water was used for spraying.

## Doctoral and Masters' dissertations

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*In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.*

Therapy of gingivitis and periodontal diseases (Die Therapie der Zahnfleischentzündung und Zahnlockerung). *R. Gefeller. 1955.* DR.MED.DENT. *West German Orthodontic Clinic, Medical Academy of Düsseldorf, Germany.*

Exogenetic causative factors in marginal periodontitis: clinical and roentgenologic examinations (Die exogenen Ursachmomente der marginalen Paradentitis: klinische und röntgenologische Untersuchungen). *F. T. Spoerry. 1955.* DR.MED.DENT. *West German Orthodontic Clinic, Medical Academy of Düsseldorf, Germany.*

Local anesthetics commonly used in dentistry (Über die in der Zahnheilkunde gebräuchlichen Lokalanästhetika). *E. Egger. 1955.* DR.MED.DENT. *West German Orthodontic Clinic, Medical Academy of Düsseldorf, Germany.*

Anatomy and physiology of the periodontium (Die Anatomie und Physiologie des Paradentiums). *R. Schnyder. 1955.* DR.MED.DENT. *West German Orthodontic Clinic, Medical Academy of Düsseldorf, Germany.*

Methods of surgical treatment in gingivitis and periodontal diseases (Die chirurgischen Behandlungsmethoden der Zahnfleischentzündung und Zahnlockerung). *C. Oeschger. 1955.* DR.MED.DENT. *West German Orthodontic Clinic, Medical Academy of Düsseldorf, Germany.*

Antibiotics in root canal treatment. (Antibiotika in der Wurzelbehandlung). *K. Wirthmüller. 1955.* DR.MED.DENT. *West German Orthodontic Clinic, Medical Academy of Düsseldorf, Germany.*

Direction of mandibular development. (Über die Steuerung des Unterkieferwachstums). *Hans Joachim Günther. 1955.* DR.MED.DENT. *University of Tübingen, Germany.*

Examinations of autoradiography in tissue sections by Siess and Seybold's impregnation technic compared with other methods such as Bomberg's moisture technic and Stripping's film method (Untersuchungen über Autoradiographie in Gewebsschnitten mit dem Imprägnierungsverfahren nach Siess und Seybold im Vergleich mit anderen Methoden—Nassverfahren nach Bomberg und Stripping Filmmethode). *Günther Diez. 1955.* DR.MED.DENT. *University of Tübingen, Germany.*

The effect of self-curing acrylic resins on the dental pulp in dogs (Zur Frage der Wirkung von schnellhärtenden Kunststoffen auf die Zahnpulpa beim Hund). *Gert Ohmstede. 1954.* DR.MED.DENT. *University of Hamburg, Germany.*

The alleviation of pain in children in general dental practice (Die Schmerzbekämpfung bei Kindern in der zahnärztlichen Allgemeinpraxis). *Ingeborg Issleiber-Petersen. 1955.* DR.MED.DENT. *University of Hamburg, Germany.*

The employment of histamine tests in dental focal infection (Über die Anwendung des Histamin-Bindehaut-Testes bei Zahnherden). *Walther Reinecken. 1955.* DR.MED.DENT. *University of Hamburg, Germany.*

Investigations into the nature of the fluorescent materials present in the teeth. *A. G. Leaver. 1954.* PH.D. *University of Liverpool.*

Investigation into the properties of the reversible and irreversible hydrocolloid impression materials with special reference to their use in conservative dentistry. *Elwyn Lloyd Hampson. 1953.* M.D.S. *University of Liverpool.*

An investigation of the physical, chemical and bacterial properties of saliva, with special reference to mucin content, and their correlation with susceptibility to dental caries. *M. R. Dewar. 1953.* PH.D. *University of London.*

The dental occlusion of primates, etc. *James Richard Ewart Mills. 1954.* M.SC. *University of Manchester.*

The influence of nutrition on the rate of eruption of the rat's incisors. *Lionel Walter Bryer. 1955.* B.SC. *Oxford University.*

Biochemical studies on saliva. *Bernard Lilienthal. 1956.* D.D.SC. *University of Sydney.*

On the histogenesis of the so-called salivary gland type mixed tumor. *Yoshihiro Shimada. 1956.* D.M.SC. *Tokyo Medical and Dental University.*

Clinicopathologic study on cancer of the mouth. *Takatoshi Ohtani. 1956.* D.M.SC. *Tokyo University.*

Development and growth of the lip-furrow-band of the pig. *Kinai Tomita. 1955.* D.M.SC. *Tokyo University.*

Studies on the musculotendinous attachment in the frog. *Takatsugu Shimoosa. 1955.* D.M.SC. *Tokyo University.*

Embryologic study on collagen fibre of the corium in birds and mammals. *Susumu Okada. 1955.* D.M.SC. *Tokyo University.*

Studies on the arrangement and formation of elastic fibres in the frog's skin: An experimental study on the development of elastic fibres. *Yukihiko Higuchi. 1955.* D.M.SC. *Tokyo University.*

Contributions to the macroscopic anatomy of the glomera coccygica in man. *Kinjiro Kubota. 1955.* D.M.SC. *Tokyo University.*

Twenty uncommon dental cases. *N. Beän. 1953.* B.D.S. *University of the Witwatersrand, South Africa.*

An experimental investigation into the mechanical factors involved in skeletal fixation of fractures of the mandible. *J. S. Knight. 1956.* PH.D. *University of Birmingham.*

Early cytologic and histologic changes in experimentally induced tumors in the submaxillary salivary glands of weanling and adult albino rats. *Samuel M. Standish. 1956.* M.SC. *Indiana University.*

The use of controlled heat as a diagnostic aid in pulp testing. *Richard Eugene Jennings. 1956.* M.S.D. *Indiana University.*

A study of stress pattern variations in buccal-lingual sections of Class II cavity restorations as a result of different cavity forms. *Willard F. Guard. 1954.* M.S.D. *University of Nebraska.*

An investigation of the anatomical measurements of the primary teeth of man. *William S. Kramer. 1954.* M.S.D. *University of Nebraska.*

A study of the direction of the enamel rods in the cervical third of the primary teeth and the cemento-enamel junction. *Wallace C. Rowe. 1954.* M.S.D. *University of Nebraska.*

A study of age changes in the pulp tissue of the primary teeth. *William C. Day. 1955.* M.S.D. *University of Nebraska.*

A study in the development of an electronic technique to measure the forces exerted on the dentition by the perioral and lingual musculature. *Robert V. Winders. 1956.* M.S.D. *Northwestern University.*

An electromyographical comparison of the temporal and masseter muscles of orthodontically treated and untreated malocclusion of the teeth. *Ralph E. Karau. 1956.* M.S.D. *Northwestern University.*

A study of the effect of low temperature heat treatment on the physical properties of orthodontic wires. *Edward A. Kemler. 1956.* M.S.D. *Northwestern University.*

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